



RFQ No. W912DW-04-Q-0139

**US Army Corps  
of Engineers®**  
Seattle District

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**Project: STRUCTURED CABLE PLANT**

**Location: COLVILLE BORDER PATROL  
COLVILLE, WASHINGTON**

**CONSTRUCTION  
AND SCOPE OF WORK**

**THIS AWARD IS ISSUED IN ACCORDANCE WITH THE  
SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM**

**100% Emerging Small Business Set-Aside**

**Closing Date: 2 AUGUST 2004**

**Closing Time: 10:00 AM PACIFIC DAYLIGHT TIME**

**REMARKS: Quotes may be faxed to (206) 764-6817, Attention: Sue Valenzuela, or mailed to US Army, Corps of Engineers, Seattle District, Attention: Sue Valenzuela, P.O. Box 3755, Seattle, WA 98124-3755.**



Section Supplies or Services and Price

INSTRUCTIONS

**THIS AWARD IS ISSUED IN ACCORDANCE WITH THE  
SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM**

1. REPRESENTATIONS AND CERTIFICATIONS CONTAINED HEREIN MUST BE COMPLETED BY QUOTERS AND RETURNED WITH OFFERS:

2. Marking of Quote Envelopes:

Envelopes shall be plainly marked as follows:

QUOTE FOR:                   STRUCTURES CABLE PLANT  
                                     COLVILLE BORDER PATROL  
                                     COLVILLE, WASHINGTON

Request for Quote No.       W912DW-04-Q-0139

CLOSING DATE AND TIME: 02 AUGUST 2004, 10:00 A.M. LOCAL TIME

AMENDMENTS NUMBERED \_\_\_\_\_ HAVE BEEN RECEIVED

3. Faxed quotes shall be accepted before closing at FAX No. 206-764-6817. Attn: Susan Valenzuela. For questions call 206-764-6691. Mailed quotes shall be accepted before closing at US Army Corps of Engineers, Seattle District, PO Box 3755 Seattle, WA. 98124. Physical street address is US Army Corps of Engineers, Seattle District, 4735 E Marginal Way S., Seattle, WA. 98134. E-mail address is [Susan.M.Valenzuela@usace.army.mil](mailto:Susan.M.Valenzuela@usace.army.mil)
4. Any contractor receiving an award is required to be registered in the CCR (Central Contracting Registry).
5. **PROSPECTIVE OFFERORS:** The Director of Defense Procurement has issued a final rule amending the Defense Federal Acquisition Regulations Supplement (DFARS) to require contractors to be registered in the DOD Central Contractor Registration (CCR) for awards resulting from solicitations issued after May 31, 1998.

This rule more efficiently implements the Debt Collection Improvement Act of 1996, as it requires contractors to be registered in CCR for consideration of future solicitations, awards, and payment. Registration is required prior to award of any contract, basic agreement, basic ordering agreement, or blanket purchase agreement from a solicitation issued after May 31, 1998. **LACK OF REGISTRATION IN THE CCR DATABASE WILL MAKE AN OFFER INELIGIBLE FOR AWARD.**

The web site may be accessed at <http://ccr2000.com>. You may call 1-888-227-2423 to obtain a Registration Packet or to register On Line at [www.acq.osd.mil/ec](http://www.acq.osd.mil/ec).

6. **ELECTRONIC FUNDS TRANSFER (EFT):** Effective 99 Jun 01, the Government will make all payments by EFT (unless the Government VISA credit card is accepted). The only exceptions are: 1) Foreign Vendors; 2) Government Agencies, and 3) One time payments. The EFT forms and instructions are on the USACE Finance Center (UFC) Web Page; [www.fc.usace.army.mil](http://www.fc.usace.army.mil) The UFC points of contact for this action are Ms. Nita Clower, 901/874-8542 and Mr. Michael Rye, 901/874-8543.
7. Award shall be made to the responsive and responsible offerors with the lowest quoted price.

8. The contractor is **required** to provide the following information with your quote:

Federal Taxpayer's ID Number:\_\_\_\_\_

DUNS Number:\_\_\_\_\_

Gsa Contract Number:\_\_\_\_\_

CCR Cage Code Number\_\_\_\_\_

Remit to Address:

Company Name:\_\_\_\_\_

Address:\_\_\_\_\_

City/State/Zip:\_\_\_\_\_

Phone & Fax Numbers:\_\_\_\_\_

Sales Rep's E-Mail Address:\_\_\_\_\_

Web Invoicing System (WInS)

WInS is an optional online invoicing system providing Department of Defense vendors an electronic means of submitting invoices for payment. Vendor registration for WinS is accomplished through the following DFAS website: <https://ecweb.dfas.mil> At the website click on NEW Account to register and select "USACE" as the payment system name. The payment office code and location is "TO-UFC Millington". To establish an account in WInS, vendors must be registered with the Central Contractor Registration (CCR).

ANNOUNCEMENT TO BIDDERS/OFFERORS

Due to recent national events Seattle District US Army Corps of Engineers shall be conducting business under heightened security for the foreseeable future.

Access to Federal Center South, 4735 E Marginal Way S, Seattle WA 98124 will be through the front Lobby only. The building is under Federal Protective Service, which means that persons entering the facility are subject to inspection; including purses, packages, etc. All deliveries shall be thoroughly inspected. In addition, visitors may be required to be escorted by Corps personnel while in the building.

For any questions please contact the Contract Specialist assigned to your project or check our website at [www.nws.usace.army.mil](http://www.nws.usace.army.mil) for up-to-date information.

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	COLVILLE - STRUCTURED CABLE PLANT FFP Provide all Labor, Equipment, Materials and supplies necessary to complete the structured cable plant project for the Colville Border Patrol Existing Station Renovation Project in accordance with the Scope of Work dated July 8, 2004 and Davis Bacon Wage Determination No. WA030003, Rev 10, Dated 7/23/2004 as incorporated herein. PURCHASE REQUEST NUMBER: W68MD9-4202-7586	1	Lump Sum		

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NET AMT

FOB: Destination

Section DD1155 - Continuation Sheet

SOW

**Department of Homeland Security  
U.S. Customs and Border Protection (USCBP)**

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National Logistics Center Laguna Niguel  
Facilities Engineering Division



**STRUCTURED CABLE PLANT  
SCOPE OF WORK**

For The

***Colville Border Patrol Existing Station Renovation Project***

***July 8, 2004***

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## **PART 1 - BACKGROUND**

### **1.1 BACKGROUND**

The Department of Homeland Security (DHS) U.S. Customs and Border Protection (USCBP) Headquarters Data Communications Branch (HQDCB) is responsible for management of the structured cable plant for USCBP initiated projects. In addition, HQDCB provides Local Area Network (LAN), Wide Area Network (WAN) and cable plant design in accordance with HQDCB standards.

## **PART 2 – GENERAL SPECIFICATIONS**

### **2.1 GENERAL REQUIREMENTS**

- A. This document describes the products and execution requirements relating to furnishing and installing Telecommunications Cabling.
- B. All cables and related terminations, support and grounding hardware shall be furnished, installed, wired, tested, labeled, and documented by the contractor as detailed in this document.
- C. Product specifications, general design considerations, and installation guidelines are provided in this document. Installation details, cable routing, if applicable are provided as an attachment to this document.
- D. The work included under this specification consists of furnishing all labor, equipment, materials, and supplies and performing all operations necessary to complete the installation of this structured cabling system in compliance with the specifications and drawings.

### **2.2 INSTALLATION ADDRESS**

U. S. Department of Homeland Security  
U. S. Customs and Border Protection  
U. S. Border Patrol Station  
209 East Juniper  
Colville, WA 99114

Ph. (509) 684-6272

### **2.3 ESTIMATED PERIOD OF PERFORMANCE**

The dates given are current at the writing of this SOW. The actual installation dates may deviate from below due to construction schedule changes. The U. S. Army Corps of Engineers Project Manager will report any updates to these dates.

- 1. The estimated Period of Performance is 8/2/2004 through 8/5/2004.

### **2.4 REGULATORY REFERENCES**

- A. The cabling system described in this document is derived from the recommendations made in recognized telecommunications industry standards. The following documents are incorporated by reference:

1. USICE Structured Cable Plant Standard
2. ANSI/TIA/EIA – 526-14, Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant – OFSTP-14
3. ANSI/TIA/EIA – 568-B.1, Commercial Building Telecommunications Cabling Standard Part 1: General Requirements
4. ANSI/TIA/EIA – 568-B.2, Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Cabling Components
5. ANSI/TIA/EIA – 568-B.3, Commercial Building Telecommunications Cabling Standard Part 3: Optical Fiber Cabling Components
6. ANSI/TIA/EIA – 568-A, Commercial Building Standard for Telecommunications Pathways and Spaces
7. ANSI/TIA/EIA – 570-A, Residential Telecommunications Cabling Standard
8. ANSI/TIA/EIA – 598, Optical Fiber Cable Color Coding
9. ANSI/TIA/EIA – 606-A, Administration Standard for Telecommunications Infrastructure of Commercial Building
10. ANSI/TIA/EIA – 607, Commercial Building Grounding and Bonding Requirements for Telecommunications
11. ANSI/TIA/EIA – 758, Customer-Owned Outside Plant Telecommunications Cabling Standard
12. BICSI-TDMM, Building Industries Consulting Services International
13. National Fire Protection Agency (NFPA-70), National Electrical Code (NEC)
14. NEMA 250
15. National Electrical Code (NEC) Articles 770 and 800
16. National Electrical Safety Code (NESC) (IEEE C 2)

- B. If this document and any of the documents listed above are in conflict, then, as a general principle, the more stringent requirement shall apply. However, in all cases where there appears to be conflict or a specification is not clear to the contractor, the USACE Project Manager or USCBP Technical Representative must be contacted for clarification.

- C. The contractor will abide by all applicable federal, state, county and local building and safety regulations.

## 2.5 COPPER CABLE INSTALLATION

- A. The contractor shall provide, place, terminate and test Unshielded Twisted Pair (UTP) cables as specified through work assignments under this SOW.
- B. Data cables will be CAT-5e.
- C. Data cable shall be terminated on CAT-5e compliant patch panels.
- D. Voice cables will be CAT-5e.
- E. Voice cable shall be terminated on .
- F. The contractor shall provide one 10-foot CAT-5e patch cord for each workstation outlet installed.

1. Patch cords should be 8-position 8-conductor manufactured assemblies using stranded cables meeting CAT-5e Specifications.
  2. Phone line cords are typically provided with end user station equipment, and are not included in this specification.
  3. For each drop location, all information outlet terminations shall follow the ANSI/TIA/EIA T568A pin assignments.
- G. The contractor is responsible for installing stranded copper patch cables from the patch panel into the electronic hardware in the Main Distribution Frame (MDF) and Remote Wiring Closet (RWC). The patch cords should be of varied lengths to maintain a neat and functional finished product.
1. Patch cords should be 8-position 8-conductor manufactured assemblies using stranded cables meeting CAT-5e Specifications.
  2. All Data "A" ports will be patched.
  3. Provisions should be made to patch approximately 30% of the Data "B" ports. The requirements for Data "B" ports will be determined by the on-site representative.
  4. All Voice "A" will be patched.
  5. Provisions should be made to patch approximately 30% of the Voice "B" ports. The requirements for Voice "B" ports will be determined by the on-site representative.
  6. Cables shall be neatly routed and tied at all racks and patch panels, and shall be dressed in a functional and visually pleasing fashion, observing bend radius requirements at all times.
- H. Separate patch panels will segregate "Data A", "Data B", and "Voice A", "Voice B" cables. The upper patch panel will be used for "Data A", only; the lower patch panel will be used for "Data B" only. Patch cables shall meet the same specifications as defined in the Copper Cable Specification Section.
- I. Voice and data at each information outlet shall be identically numbered, where practical (e.g. cable IDs for voice and data shall match at each location). Data cables may share the same faceplate as voice, provided the hardware used matches make, model, and color.
- J. Additional drops may be requested from the date of award, whereas the USCBP will issue a change request or addendum for any changes, additions or modifications in this scope of work.

## 2.6 COPPER CABLE SPECIFICATIONS

- A. All cable, equipment, and materials shall meet applicable ANSI/TIA/EIA 568-B, National Electrical Code (NEC) 770, Institute of Electrical and Electronics Engineers (IEEE) 802 and Underwriters Laboratory (UL) Verification Program standards.
- B. All cable equipment and materials must be manufactured by facilities that are International Organization for Standardization (ISO) 9001 registered and certified as follows:
  1. Shall be CAT-5e rating in accordance with ANSI/TIA/EIA 568-B.
  2. Four-pair, 100-Ohm, 24 American Wire Gauge (AWG).
  3. The cable should have contiguous, two-foot segment-length markers printed on the cable jacket. The markings must also show the applicable performance CAT-5e, as well as the fire rating of the cable being installed.

4. The finished cable shall be 100% plenum rated in accordance with the requirements of NEC Article 800, UL 444, NFPA 262, (UL 910), and applicable CSA standards.

## 2.7 DATA FIBER CABLE INSTALLATION

- A. Fiber optic cable shall be used for all backbone links (if applicable).
- B. One 12-strand multimode optical fiber cable shall be installed from the MDF to each RWC to provide data backbone connectivity.
- C. All ANSI/TIA/EIA – 568-B.1 requirements for fiber cable installation and termination will be observed.
- D. All strands of each fiber cable shall be terminated at each end of the cable.
- E. The fiber will be terminated in a standard rack-mounted fiber optic distribution box.
- F. All fiber connections in the distribution boxes shall be T568SC.
- G. The contractor is responsible for installing fiber patch cables from the distribution boxes into the electronic hardware in the MDF and each RWC.
- H. Fiber patch cords shall be multimode, duplex, 3 meters in length, SC to SC.
- I. Provisions should be made to patch each RWC to the MDF. Two fiber patch cables are therefore required for each RWC. One to patch the electronic equipment to the fiber distribution box in the RWC and one to patch the electronic equipment to the fiber distribution box in the MDF.
- J. Provisions should be made to supply approximately 30% additional fiber patch cords for future requirements and/or maintenance spares.

## 2.8 DATA FIBER CABLE SPECIFICATIONS

- A. All fiber cable shall be 12-strand multimode 62.5x125  $\mu\text{m}$  optical fiber.
- B. All fiber cable shall be of interlocking armor construction eliminating the need for conduit or plenum rated inner duct.
- C. Fiber cable shall be colored orange to denote multimode fiber.
- D. Plenum rated fiber cable is required by the USCBP for backbone cables routed within buildings.
- E. Outside plant fiber cable shall have a water block construction and meet the requirements for compound flow and water penetration.

## 2.9 TEST AND ACCEPTANCE

- A. The installation contractor shall complete all testing of the cable plant, under the following criteria:
  - 1. The installation contractor is responsible for providing all personnel, equipment, instrumentation, and supplies that are necessary to perform the required testing.
  - 2. All work shall be ANSI/TIA/EIA 568-B, NEC 770, and IEEE 802 standard specification quality (as applicable) and will be subject to review and acceptance by the authorized USCBP representatives.
  - 3. Any work that does not meet or exceed these standards will be reported to the contractor who must take immediate action to correct the deficiency at no additional cost to USCBP.
- B. All installed copper cables shall be tested with a Level III cable tester to certify that the cable conforms to ANSI/TIA/EIA 568-B requirements.
- C. At the completion of the installation and termination of cable, the contractor will test all cabling as set forth by the applicable standards as specified in this SOW.
- D. Testing shall verify that the final termination of all cabling is operational and meets the operational specifications for each type of wiring as specified in this SOW.
- E. The contractor is responsible for replacing any cable that does not pass testing as prescribed by the applicable standards as specified in this SOW.
- F. After the fiber cable has been installed and terminated, the contractor shall test the fiber cable to insure that it will function properly, and that all applicable specifications have been met.
- G. All fiber terminations shall be tested for attenuation with an optical power meter and light source.

## 2.10 TECHNICAL DELIVERABLES

The contractor shall ensure all documentation meets the requirements, as specified in the ANSI/TIA/EIA 606 Standards. Where a conflict may exist between the ANSI/TIA/EIA 606 and the USCBP Structured Cable Plant Standard documentation, the USICE Structured Cable Plant Standard documentation shall prevail. Contractor shall provide two hardcopies and two softcopies of the following to the U. S. Army Corps of Engineers Project Manager:

- 1. Letter of certification from the installing organization.
- 2. Completed Contractor Information Form.
- 3. Implementation report.
- 4. Detailed materials list.
- 5. Cable plant test certification letter.
- 6. Electronic Copper cable test results (soft copy only).
- 7. Certification summary report.
- 8. Electronic Fiber-optic cable test results (soft copy only).
- 9. Certification summary report.
- 10. As-built site drawings.

## 2.11 CONTRACTOR PERSONNEL

- A. The contractor will provide a lead technician to be on site at all times while work is in progress.

- B. For continuity and logistics, the USCBP recommends that the same lead technician oversee this project from inception through completion.

#### 2.12 PROJECT UPDATES

- A. If requested by the USCBP On-Site Representative, the contractor's lead technician will provide a daily verbal briefing. This briefing will include, but is not limited to, work status, milestone status, and any issues.
- B. The contractor's lead technician will provide a daily electronic briefing to . This briefing will include, but is not limited to, work status, milestone status, and any issues.

#### 2.13 SITE CLEANUP

The contractor is responsible for coordination with the site general contractor or property/facility management contractor for the removal of all debris resulting from the work being performed by the contractor on a daily basis.

#### 2.14 FACILITY DAMAGE

The contractor is responsible for any damage incurred while in the process of performing work including, but not limited to, damaged voice and/or data hardware, damaged ceiling tiles and walls, and scratched furniture. Any damage should be reported immediately to and .

#### 2.15 LICENSES AND PERMITS

- A. The contractor is responsible for acquiring any and all permits as required.
- B. The contractor is responsible for maintaining all required federal and local licenses and privilege permits.

#### 2.16 SITE ACCESS

The contractor is responsible for coordinating with the USCBP On-Site Representative for site access privileges and required individual safety training.

### **PART 3 – WARRANTY**

#### 3.1 WARRANTY

- A. The warranty shall cover the failure of the wiring system to support current or future applications that are designed for the link/channel specifications of TIA/EIA -568-B.
- B. The contractor shall provide two years warranty on parts and labor.

**Attachment A**

**Specific Site Requirements**

1. There are total of 12 drops locations. 12 drops will be dual data/dual voice.
2. The average cable pull length is estimated at 200 feet.
3. Installation will be required in occupied space.
4. Cable tray is not installed for low-voltage communications wiring and does require "J" hooks installed for cable distribution.
- 5.
- 6.

**Attachment B****Project Summary Page**

<b>Site Specific Information</b>	
<u>Site name:</u> Colville BPS	<u>DSR number:</u> N/A
<u>Address:</u> 209 East Juniper	<u>Project name:</u> Colville BPS Modification
<u>City:</u> Colville	<u>Security requirements:</u> Occupied, C-2 Required
<u>State:</u> WA	<u>Period of performance:</u> 8/2/2004 – 8/5/2004
<u>Zip code:</u> 99114	<u>Installation Dates:</u> 8/2/2004 – 8/5/2004

<b>Points Of Contact</b>	
<b>USACE PROJECT MANAGER</b>	<b>USCBP On-Site Representative</b>
<u>Name:</u> Jim Phillip	<u>Name:</u> Carl A. Eklund (Patrol Agent In Charge)
<u>Voice:</u>	<u>Voice:</u> (509) 684-6272
<u>Cell:</u>	<u>Cell:</u> (509) 675-3170
<u>E-Mail:</u>	<u>E-Mail:</u> Carl.Eklund@DHS.Gov

<b>Cable Installation Requirements</b>	
<u>Cable type:</u> CAT-5e	<u>Rack:</u>
<u>Data Patch panel:</u>	<u>Number of rack(s) needed:</u>
<u>Voice Patch panel:</u>	<u>Cabinet:</u> N/A
<u>Estimated cable pulls length:</u> 200	<u>Number of cabinet(s) needed:</u>
<u>Cable tray installed?</u> No	<u>J hooks required?</u> Yes
<b>Drop Specifics</b>	
<u>Dual Data/Dual Voice:</u> 12	<u>Quad Data/Dual Voice:</u>
<u>Dual Data/Single Voice:</u>	<u>Quad Data/No Voice:</u>
<u>Dual Data/No Voice:</u>	<u>No Data/Single Voice:</u>
<u>Total Drops:</u> 12	

Attachment to Solicitation: Technical Paper INS Structured Cabling Standards, Dated January 31, 2001

CLAUSES INCORPORATED BY REFERENCE

52.204-3	Taxpayer Identification	OCT 1998
52.204-6	Data Universal Numbering System (DUNS) Number	OCT 2003
52.219-6	Notice Of Total Small Business Set-Aside	JUN 2003



52.219-8	Utilization of Small Business Concerns	MAY 2004
52.219-20	Notice of Emerging Small Business Set-Aside	JAN 1991
52.219-21	Small Business Size Representation For Targeted Industry Categories Under The Small Business Competitiveness Demonstration Program	MAY 1999
52.222-6	Davis Bacon Act	FEB 1995
52.222-7	Withholding of Funds	FEB 1988
52.222-8	Payrolls and Basic Records	FEB 1988
52.222-9	Apprentices and Trainees	FEB 1988
52.222-11	Subcontracts (Labor Standards)	FEB 1988
52.222-12	Contract Termination-Debarment	FEB 1988
52.222-13	Compliance with Davis -Bacon and Related Act Regulations.	FEB 1988
52.222-14	Disputes Concerning Labor Standards	FEB 1988
52.222-15	Certification of Eligibility	FEB 1988
52.223-6	Drug-Free Workplace	MAY 2001
52.232-27	Prompt Payment for Construction Contracts	OCT 2003
52.236-2	Differing Site Conditions	APR 1984
52.236-3	Site Investigation and Conditions Affecting the Work	APR 1984
52.236-4	Physical Data	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.242-14	Suspension of Work	APR 1984
52.242-15	Stop-Work Order	AUG 1989
52.242-17	Government Delay Of Work	APR 1984
52.243-5	Changes and Changed Conditions	APR 1984
52.246-21	Warranty of Construction	MAR 1994
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.249-13	Failure To Perform	APR 1984
52.249-14	Excusable Delays	APR 1984
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense- Contract-Related Felonies	MAR 1999
252.204-7004 Alt A	Required Central Contractor Registration Alternate A	NOV 2003
252.217-7015	Safety and Health	DEC 1991
252.219-7011	Notification to Delay Performance	JUN 1998

#### CLAUSES INCORPORATED BY FULL TEXT

#### Successor Contracting Officers (52.201-4001)

The Contracting Officer who signed this contract is the primary Contracting Officer for the contract. Nevertheless, any Contracting Officer assigned to the Seattle District and acting within his/her authority may take formal action on this contract when a contract action needs to be taken and the primary Contracting Officer is unavailable.

52.213-4 TERMS AND CONDITIONS--SIMPLIFIED ACQUISITIONS (OTHER THAN COMMERCIAL ITEMS) (JUN 2004)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses that are incorporated by reference:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-3, Convict Labor (June 2003) (E.O. 11755).

(ii) 52.222-21, Prohibition of Segregated Facilities (Feb 1999) (E.O. 11246).

(iii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iv) 52.225-13, Restrictions on Certain Foreign Purchases (Dec 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

(v) 52.233-3, Protest After Award (Aug 1996) (31 U.S.C. 3553).

(2) Listed below are additional clauses that apply:

(i) 52.232-1, Payments (Apr 1984).

(ii) 52.232-8, Discounts for Prompt Payment (Feb 2002).

(iii) 52.232-11, Extras (Apr 1984).

(iv) 52.232-25, Prompt Payment (Oct 2003).

(v) 52.233-1, Disputes (Jul 2002).

(vi) 52.244-6, Subcontracts for Commercial Items (May 2004).

(vii) 52.253-1, Computer Generated Forms (Jan 1991).

(b) The Contractor shall comply with the following FAR clauses, incorporated by reference, unless the circumstances do not apply:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (Jun 2004) (E.O. 13126). (Applies to contracts for supplies exceeding the micro-purchase threshold.)

(ii) 52.222-20, Walsh-Healey Public Contracts Act (DEC 1996) (41 U.S.C. 35-45) (Applies to supply contracts over \$10,000 in the United States, Puerto Rico, or the U.S. Virgin Islands).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts of \$25,000 or more).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793) (Applies to contracts over \$10,000, unless the work is to be performed outside the United States by employees recruited outside the United States.) (For

purposes of this clause, United States includes the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.).

(v) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts over \$25,000).

(vi) 52.222-41, Service Contract Act, As Amended (May 1989) (41 U.S.C. 351, et seq.) (Applies to service contracts over \$2,500 that are subject to the Service Contract Act and will be performed in the United States, District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, Johnston Island, Wake Island, or the outer continental shelf lands.).

(vii) 52.223-5, Pollution Prevention and Right-to-Know Information (Aug 2003) (E.O. 13148) (Applies to services performed on Federal facilities).

(viii) 52.225-1, Buy American Act--Supplies (June 2003) (41 U.S.C. 10a-10d) (Applies to contracts for supplies, and to contracts for services involving the furnishing of supplies, for use in the United States or its outlying areas, if the value of the supply contract or supply portion of a service contract exceeds the micro-purchase threshold and the **acquisition--**

(A) Is set aside for small business concerns; or

(B) Cannot be set aside for small business concerns (see 19.502-2), and does not exceed \$25,000.)

(ix) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (May 1999). (Applies when the payment will be made by electronic funds transfer (EFT) and the payment office uses the Central Contractor Registration (CCR) database as its source of EFT information.)

(x) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (Oct 2003). (Applies when the payment will be made by EFT and the payment office does not use the CCR database as its source of EFT information.)

(xi) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241). (Applies to supplies transported by ocean vessels (except for the types of subcontracts listed at 47.504(d).)

(2) Listed below are additional clauses that may apply:

(i) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment (JULY 1995) (Applies to contracts over \$25,000).

(ii) 52.211-17, Delivery of Excess Quantities (SEPT 1989) (Applies to fixed-price supplies).

(iii) 52.247-29, F.o.b. Origin (JUN 1988) (Applies to supplies if delivery is f.o.b. origin).

(iv) 52.247-34, F.o.b. Destination (NOV 1991) (Applies to supplies if delivery is f.o.b. destination).

(c) FAR 52.252-2, Clauses Incorporated by Reference (FEB 1998). This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>  
<http://www.farsite.hill.af.mil>  
<http://www.dtic.mil/dfars>

(d) Inspection/Acceptance. The Contractor shall tender for acceptance only those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance.

The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. The Government must exercise its postacceptance rights--

- (1) Within a reasonable period of time after the defect was discovered or should have been discovered; and
  - (2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.
- (e) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence, such as acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.
- (f) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges that the Contractor can demonstrate to the satisfaction of the Government, using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred that reasonably could have been avoided.
- (g) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.
- (h) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(End of clause)

## **52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2004)**

- (a)(1) The North American Industry Classification System (NAICS) code for this acquisition is **238210**.
  - (2) The small business size standard is **\$12.0 Million**.
  - (3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.
- (b) Representations. (1) The offeror represents as part of its offer that it ( ) is, ( ) is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ( ) is, ( ) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a service-disabled veteran-owned small business concern.

(6) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, as part of its offer, that--

(i) It ( ) is, ( ) is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It ( ) is, ( ) is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:\_\_\_\_\_.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women; in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

#### 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (JUN 2003)

(a) Definitions. As used in this clause--

Component means an article, material, or supply incorporated directly into a construction material.

Construction material means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

Domestic construction material means--

- (1) An unmanufactured construction material mined or produced in the United States; or
- (2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

Foreign construction material means a construction material other than a domestic construction material.

United States means the 50 States, the District of Columbia, and outlying areas.

(b) Domestic preference. (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows: "none"

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American Act. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars) \1\
Item 1			
Foreign construction material....			
Domestic construction material...			
Item 2			
Foreign construction material....			
Domestic construction material...			

Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued). List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary. Include other applicable supporting information.

(End of clause)

52.236-1 PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least one hundred (100%) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

(End of clause)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)



This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>  
<http://www.farsite.hill.af.mil>  
<http://www.dtic.mil/dfars>

(End of provision

### DAVIS BACON

## **General Decision Number: WA030003 07/23/2004**

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General Decision Number: WA030003 07/23/2004

Superseded General Decision Number: WA020003

**State: Washington**

Construction Types: **Building**

Counties: Adams, Asotin, Columbia, Douglas, Ferry, Garfield, Grant, Lincoln, Okanogan, Pend Oreille, **Stevens**, Walla Walla and Whitman Counties in Washington.

**BUILDING CONSTRUCTION PROJECTS** (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
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0	06/13/2003
1	01/23/2004
2	02/06/2004
3	02/13/2004
4	03/05/2004
5	03/12/2004
6	04/16/2004
7	05/14/2004
8	06/18/2004
9	07/02/2004
10	07/23/2004

BOIL0242-002 01/01/2004

DOUGLAS AND OKANOGAN COUNTIES WHICH LIES WEST OF THE 120TH  
MERIDIAN

	Rates	Fringes
Boilermaker.....	\$ 28.10	15.37

BRWA0003-002 06/01/2003

	Rates	Fringes
Bricklayer.....	\$ 23.16	9.21

BRWA0003-007 06/01/2003

DOUGLAS AND OKANOGAN COUNTIES WHICH LIES WEST OF THE 120TH

## MERIDIAN

	Rates	Fringes
Terrazzo Worker.....	\$ 18.50	7.13
Tile & Terrazzo Finisher.....	\$ 14.70	7.13
Tile Layer.....	\$ 18.50	7.13

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CARP0001-007 06/01/2004

	Rates	Fringes
Carpenters:		
ADAMS, COLUMBIA, DOUGLAS		
WHICH LIES EAST OF THE		
120TH MERIDIAN, FERRY,		
GRANT, OKANOGAN WHICH LIES		
EAST OF THE 120TH MERIDIAN		
AND WALLA WALLA COUNTIES		
CARPENTERS/INSULATION		
APPLICATOR.....	\$ 23.88	7.45
DIVERS TENDERS.....	\$ 28.02	7.45
DIVERS.....	\$ 59.17	7.45
MILLWRIGHTS.....	\$ 24.99	7.45
PILEDRIERS.....	\$ 24.15	7.45
ASOTIN, GARFIELD, LINCOLN,		
PEND OREILLE, <b>STEVENS</b> , AND		
WHITMAN COUNTIES		
CARPENTERS/INSULATION		
APPLICATOR.....	\$ 23.21	7.45
DIVERS TENDERS.....	\$ 27.30	7.45
DIVERS.....	\$ 57.50	7.45
MILLWRIGHTS.....	\$ 24.31	7.45
PILEDRIERS.....	\$ 23.21	7.45

## HAZMAT PROJECTS

Anyone working on a HAZMAT job (task, where HAZMAT certification is required, shall be compensated at a premium, in addition to the classification working in as follows:

LEVEL D+ \$.25 per hour - This is the lowest level of proection. No respirator is used and skin proection is minimal.

LEVEL C+ \$.50 per hour - This level uses an air purifying respirator or additional protective clothing.

LEVEL B+ \$.75 per hour - Uses same respirator protection as Level A. Supplied air line is provided in conjunction with a chemical "splash suit."

LEVEL A+ \$1.00 per hour - This level utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line.

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CARP0770-005 06/01/2003DOUGLAS AND OKANOGAN COUNTIES WHICH LIES WEST OF THE 120TH  
MERIDIAN

	Rates	Fringes
Carpenters:		
ACCOUSTICAL WORKERS.....	\$ 20.98	9.22

BRIDGE, DOCK & WHARF		
CARPENTERS AND HEAVY &		
HIGHWAY.....	\$ 28.40	9.22
CARPENTERS AND DRYWALL		
APPLICATORS.....	\$ 20.72	9.22
CARPENTERS ON CREOSOTED		
MATERIALS.....	\$ 20.82	9.22
DIVER TENDERS.....	\$ 31.17	9.50
DIVERS.....	\$ 70.07	9.50
INSULATION APPLICATORS.....	\$ 20.72	9.22
MILLWRIGHTS AND MACHINE		
ERECTORS.....	\$ 29.40	9.22
PILEDRIIVER, DIVING,		
PULLING AND PLACING COLLARS	\$ 28.60	9.22
SAWFILER, STATIONARY POWER		
SAW OPERATORS, FLOOR		
FINISHER, FLOOR LAYER,		
SHINGLERS, FLOOR SANDER		
OPERATOR AND OPERATORS OF		
OTHER STATIONARY WOOD		
WORKING TOOLS.....	\$ 20.85	9.22

(HOURLY ZONE PAY APPLICABLE TO ALL CLASSIFICATIONS EXCEPT  
MILLWRIGHTS AND PILEDRIIVERS)

Hourly Zone pay shall be paid on jobs located outside of the  
free zone computed from the city center of the following  
listed cities:

Seattle	Olympia	Bellingham
Auburn	Bremerton	Anacortes
Renton	Shelton	Yakima
Aberdeen-Hoquiam	Tacoma	Wenatchee
Ellensburg	Everett	Port Angeles
Centralia	Mount Vernon	Sunnyside
Chelan	Pt. Townsend	

Zone Pay:

0 -25	radius miles	Free
25-35	radius miles	\$1.00/hour
35-45	radius miles	\$1.15/hour
45-55	radius miles	\$1.35/hour
Over 55	radius miles	\$1.55/hour

(HOURLY ZONE PAY - MILLWRIGHTS AND PILEDRIIVERS ONLY)

Hourly Zone Pay shall be computed from Seattle Union Hall,  
Tacoma City center, and Everett City center

Zone Pay:

0 -25	radius miles	Free
25-45	radius miles	\$ .70/hour
Over 45	radius miles	\$1.50/hour

Millwrights and Piledriivers who reside in Aberdeen,  
Bellingham, Port Angeles, Mount Vernon, Olympia, Wenatchee,  
or Yakima Local Union jurisdiction areas, working on jobs  
in their respective area, shall have their Zone Pay  
measured from their respective city center

ADAMS, FERRY, LINCOLN, PEND OREILLE **STEVENS** AND WHITMAN  
COUNTIES

	Rates	Fringes
Cable splicer.....	\$ 24.07	3%+11.58
Electrician.....	\$ 23.67	3%+11.58

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ELEC0073-005 06/01/2003

ADAMS, FERRY, LINCOLN, PEND OREILLE, **STEVENS** AND WHITMAN  
COUNTIES

	Rates	Fringes
Sound & Communication Technician.....	\$ 18.95	7.90

SCOPE OF WORK:

Includes the installation, testing, service and maintenance, of the following systems which utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms and low voltage master clock systems.

A. Communications Systems that Transmit or Receive Information and/or Control Systems that are Intrinsic to the above listed systems SCADA (Supervisory control/data acquisition PCM (Pulse code modulation) Inventory control systems Digital data systems Broadband & baseband and carriers Point of sale systems VSAT data systems Data communication systems RF and remote control systems Fiber optic data systems

B. Sound and Voice Transmission/Transference Systems Background-Foreground Music Intercom and Telephone Interconnect Systems Sound and Musical Entertainment Systems Nurse Call Systems Radio Page Systems School Intercom and Sound Systems Burglar Alarm Systems Low-Voltage Master Clock Systems Multi-Media/Multiplex Systems Telephone Systems RF Systems and Antennas and Wave Guide

C. \*Fire Alarm Systems-installation, wire pulling and testing.

D. Television and Video Systems Television Monitoring and Surveillance Systems Video Security Systems Video Entertainment Systems Video Educational Systems Microwave Transmission Systems CATV and CCTV

E. Security Systems Perimeter Security Systems Vibration Sensor Systems Sonar/Infrared Monitoring Equipment Access Control Systems Card Access Systems

F. Energy Management Systems.

1. Install all low voltage devices or equipment.
2. Install all low voltage wire not in conduit.
3. Make all low voltage wire terminations that are properly seperated from the line voltage side.
4. Install any panel or equipment the contains only low

voltage control elements, but has line voltage as a power source.

5. Install chases and /or nipples, not to exceed ten (10) feet, on sytems not in conduit.

6. Install all low voltage wire through chases and/or nipples on systems not in conduit.

\*Fire Alarm Systems

1. Fire Alarms-In Raceways

a. Wire and cable pulling, in raceways, performed at the current electrician wage rate and fringe benefits.

b. Installation and termination of devices, panels, startup, testing and programming performed by the technician.

2. Fire Alarms-Open Wire Systems

a. Open wire systems installed by the technician.

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ELEC0112-004 06/01/2004

ASOTIN, COLUMBIA, GARFIELD, AND WALLA WALLA COUNTIES

	Rates	Fringes
Cable splicer.....	\$ 31.24	3%+12.28
Electrician.....	\$ 29.75	3%+12.28

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ELEC0112-008 06/01/2002

ASOTIN, COLUMBIA, GARFIELD, AND WALLA WALLA COUNTIES

	Rates	Fringes
Sound & Communication Technician.....	\$ 19.97	5.93

SCOPE OF WORK

The work covered shall include the installation, testing, service and maintenance, of the following systems that utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for TV monitoring and surveillance, background foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms and low voltage master clock systems.

A. Communication systems that transmit or receive information and/or control systems that are intrinsic to the above listed systems: SCADA (Supervisory control/data acquisition PCM (Pulse code modulation) Inventory control systems Digital data systems Broadband & baseband and carriers Point of sale systems VSAT data systems Data communication systems RF and remote control systems Fiber optic data systems

B. Sound and Voice Transmission/Transference Systems: Background-Foreground Music Intercom and Telephone Interconnect Systems Sound and Musical Entertainment Systems Nurse Call Systems Radio Page Systems School Intercom and Sound Systems Burglar Alarm Systems Low-Voltage Master Clock Systems Multi-Media/Multiplex Systems Telephone Systems RF Systems and Antennas and Wave Guide

- C. \*Fire Alarm Systems-installation, wire pulling and testing.
  - D. Television and Video Systems: Television Monitoring and Surveillance Systems Video Security Systems Video Entertainment Systems Video Educational Systems Microwave Transmission Systems CATV and CCTV
  - E. Security Systems: Perimeter Security Systems Vibration Sensor Systems Sonar/Infrared Monitoring Equipment Access Control Systems Card Access Systems
  - F. Energy Management Systems.
    - 1. Install all low voltage devices or equipment.
    - 2. Install all low voltage wire not in conduit.
    - 3. Make all low voltage wire terminations that are properly seperated from the line voltage side.
    - 4. Install any panel or equipment the contains only low voltage control elements, but has line voltage as a power source.
    - 5. Install chases and /or nipples, not to exceed ten (10) feet, on sytems not in conduit.
    - 6. Install all low voltage wire through chases and/or nipples on systems not in conduit.
- \*Fire Alarm Systems
- 1. Fire Alarms-In Raceways
    - a. Wire and cable pulling, in raceways, performed at the current electrician wage rate and fringe benefits.
    - b. Installation and termination of devices, panels, startup, testing and programming performed by the technician.
  - 2. Fire Alarms-Open Wire Systems
    - a. Open wire systems installed by the technician.

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ELEC0191-006 06/01/2003

DOUGLAS AND OKANOGAN COUNTIES

	Rates	Fringes
Sound & Communication Technician.....	\$ 22.50	4.87

SCOPE OF WORK

The work covered shall include the installation, testing, service and maintenance, of the following systems that utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for TV monitoring and surveillance, background foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms and low voltage master clock systems.

A. Communication systems that transmit or receive information and/or control systems that are intrinsic to the above listed systems: SCADA (Supervisory control/data acquisition PCM (Pulse code modulation) Inventory control systems Digital data systems Broadband & baseband and carriers Point of sale systems VSAT data systems Data communication systems RF and remote control systems Fiber optic data

systems

B. Sound and Voice Transmission/Transference Systems:

Background-Foreground Music Intercom and Telephone  
Interconnect Systems Sound and Musical Entertainment  
Systems Nurse Call Systems Radio Page Systems School  
Intercom and Sound Systems Burglar Alarm Systems  
Low-Voltage Master Clock Systems Multi-Media/Multiplex  
Systems Telephone Systems RF Systems and Antennas and Wave  
Guide

C. \*Fire Alarm Systems-installation, wire pulling and  
testing.

D. Television and Video Systems: Television Monitoring and  
Surveillance Systems Video Security Systems Video  
Entertainment Systems Video Educational Systems Microwave  
Transmission Systems CATV and CCTV

E. Security Systems: Perimeter Security Systems Vibration  
Sensor Systems Sonar/Infrared Monitoring Equipment Access  
Control Systems Card Access Systems

F. Energy Management Systems.

1. Install all low voltage devices or equipment.
2. Install all low voltage wire not in conduit.
3. Make all low voltage wire terminations that are properly  
seperated from the line voltage side.
4. Install any panel or equipment the contains only low  
voltage control elements, but has line voltage as a power  
source.
5. Install chases and /or nipples, not to exceed ten (10)  
feet, on sytems not in conduit.
6. Install all low voltage wire through chases and/or nipples  
on systems not in conduit.

\*Fire Alarm Systems

1. Fire Alarms-In Raceways
  - a. Wire and cable pulling, in raceways, performed at the  
current electrician wage rate and fringe benefits.
  - b. Installation and termination of devices, panels, startup,  
testing and programming performed by the technician.
2. Fire Alarms-Open Wire Systems
  - a. Open wire systems installed by the technician.

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ELEC0191-007 09/01/2003

DOUGLAS, GRANT AND OKANOGAN COUNTIES

	Rates	Fringes
Cable splicer.....	\$ 29.33	3%+9.78
Electrician.....	\$ 26.66	3%+9.78

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ELEV0019-004 01/01/2004

	Rates	Fringes
Elevator Mechanic.....	\$ 35.335	10.765+a

FOOTNOTE

a: Vacation Pay: 8% with 5 or more years of service, 6% for  
6 months to 5 years service. Paid Holidays: New Years  
Day, Memorial Day, Independence Day, Labor Day,  
Thanksgiving Day and Friday after, and Christmas Day.

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 ENGI0302-008 06/01/2004

DOUGLAS AND OKANOGAN COUNTIES WHICH LIES WEST OF THE 120TH  
 MERIDIAN)

ON PROJECTS DESCRIBED IN FOOTNOTE A BELOW, THE RATE FOR EACH  
 GROUP SHALL BE 95% OF THE BASE RATE PLUS FULL FRINGE BENEFITS.  
 ON ALL OTHER WORK, THE FOLLOWING RATES APPLY.

	Rates	Fringes
Power equipment operators:		
Zone 1 (0-25 radius miles):		
GROUP 1A.....	\$ 31.67	10.25
GROUP 1AA.....	\$ 31.15	10.25
GROUP 1AAA.....	\$ 30.61	10.25
GROUP 1.....	\$ 30.09	10.25
GROUP 2.....	\$ 29.63	10.25
GROUP 3.....	\$ 29.24	10.25
GROUP 4.....	\$ 27.01	10.25
Zone Differential (Add to Zone 1 rates):		
Zone 2 (26-45 radius miles) - \$ .70		
Zone 3 (Over 45 radius miles) - \$1.00		
BASEPOINTS: Aberdeen, Bellingham, Bremerton, Everett, Kent, Mount Vernon, Port Angeles, Port Townsend, Seattle, Shelton, Wenatchee, Yakima		

#### POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1AAA - Cranes-over 300 tons, or 300 ft of boom  
 (including jib with attachments)

GROUP 1AA - Cranes 200 to 300 tons, or 250 ft of boom  
 (including jib with attachments); Tower crane over 175 ft  
 in height, base to boom

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom  
 (including jib with attachments); Crane-overhead, bridge  
 type, 100 tons and over; Tower crane up to 175 ft in height  
 base to boom; Loaders-overhead, 8 yards and over; Shovels,  
 excavator, backhoes-6 yards and over with attachments

GROUP 1 - Cableway; Cranes 45 tons thru 99 tons, under 150 ft  
 of boom (including jib with attachments); Crane-overhead,  
 bridge type, 45 tons thru 99 tons; Derricks on **building**  
 work; Excavator, shovel, backhoes over 3 yards and under 6  
 yards; Hard tail end dump articulating off-road equipment  
 45 yards and over; Loader- overhead 6 yards to, but not  
 including 8 yards; Mucking machine, mole, tunnel, drill  
 and/or shield; Quad 9, HD 41, D-10; Remote control operator  
 on rubber tired earth moving equipment; Rollagon;  
 Scrapers-self propelled 45 yards and over; Slipform pavers;  
 Transporters, all truck or track type

GROUP 2 - Barrier machine (zipper); Batch Plant Operaor-  
 Concrete; Bump Cutter; Cranes, 20 tons thru 44 tons with  
 attachments; Crane-overhead, bridge type-20 tons through 44  
 tons; Chipper; Concrete Pump-truck mount with boom  
 attachment; Crusher; Deck Engineer/Deck Winches (power);  
 Drilling machine; Excavator, shovel, backhoe-3yards and  
 under; Finishing Machine, Bidwell, Gamaco and similar  
 equipment; Guardrail punch; Horizontal/directional drill



operator; Loaders-overhead under 6 yards; Loaders-plant feed; Locomotives-all; Mechanics-all; Mixers-asphalt plant; Motor patrol graders-finishing; Piledriver (other than crane mount); Roto-mill, roto-grinder; Screedman, spreader, topside operator-Blaw Knox, Cedar Rapids, Jaeger, Caterpillar, Barbar Green; Scraper-self propelled, hard tail end dump, articulating off-road equipment-under 45 yards; Subgrade trimmer; Tractors, backhoes-over 75 hp; Transfer material service machine-shuttle buggy, blaw knox-roadtec; Truck crane oiler/driver-100 tons and over; Truck Mount portable conveyor; Yo Yo Pay dozer

GROUP 3 - Conveyors; Cranes-thru 19 tons with attachments; A-frame crane over 10 tons; Drill oilers-auger type, truck or crane mount; Dozers-D-9 and under; Forklift-3000 lbs. and over with attachments; Horizontal/directional drill locator; Outside hoists-(elevators and manlifts), air tuggers, strato tower bucket elevators; Hydralifts/boom trucks over 10 tons; Loader-elevating type, belt; Motor patrol grader-nonfinishing; Plant oiler- asphalt, crusher; Pumps-concrete; Roller, plant mix or multi-lift materials; Saws-concrete; Scrpers-concrete and carry-all; Service engineer-equipment; Trenching machines; Truck Crane Oiler/Driver under 100 tons; Tractors, backhoe 75 hp and under

GROUP 4 - Assistant Engineer; Bobcat; Brooms; Compressor; Concrete finish mahine-laser screed; Cranes-A frame-10 tons and under; Elevator and Manlift-permanent or shaft type; Gradechecker, Stakehop; Forklifts under 3000 lbs. with attachments; Hydralifts/boom trucks, 10 tons and under; Oil distributors, blower distribution and mulch seeding operator; Pavement breaker; Posthole digger, mechanical; Power plant; Pumps, water; Rigger and Bellman; Roller-other than plant mix; Wheel Tractors, farmall type; Shotcrete/gunite equipment operator

FOOTNOTE A-Reduced rates may be paid on the following:

1. Projects involving work on structures such as **buildings** and bridges whose total value is less than \$1.5 million excluding mechanical, electrical, and utility portions of the contract.
2. Projects of less than \$1 million where no **building** is involved. Surfacing and paving included, but utilities excluded.
3. Marine projects (docks, wharfs, etc.) less than \$150,000.

#### HANDLING OF HAZARDOUS WASTE MATERIALS:

Personnel in all craft classifications subject to working inside a federally designated hazardous perimeter shall be eligible for compensation in accordance with the following group schedule relative to the level of hazardous waste as outlined in the specific hazardous waste project site safety plan.

H-1 Base wage rate when on a hazardous waste site when not outfitted with protective clothing

H-2 Class "C" Suit - Base wage rate plus \$ .25 per hour.

H-3 Class "B" Suit - Base wage rate plus \$ .50 per hour.

H-4 Class "A" Suit - Base wage rate plus \$ .75 per hour.

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 ENGI0370-004 08/01/2003

ALL COVERED COUNTIES (EXCLUDING DOUGLAS AND OKANOGAN COUNTIES  
 WHICH LIES WEST OF THE 120TH MERIDIAN)

ZONE 1:

	Rates	Fringes
Power equipment operators:		
GROUP 1A.....	\$ 20.44	7.37
GROUP 1.....	\$ 20.99	7.37
GROUP 2.....	\$ 21.31	7.37
GROUP 3.....	\$ 21.92	7.37
GROUP 4.....	\$ 22.08	7.37
GROUP 5.....	\$ 22.24	7.37
GROUP 6.....	\$ 22.52	7.37
GROUP 7.....	\$ 22.79	7.37
GROUP 8.....	\$ 23.89	7.37

ZONE DIFFERENTIAL (Add to Zone 1 rate): Zone 2 - \$2.00

Zone 1: Within 45 mile radius of Spokane, Moses Lake, Pasco,  
 Washington; Lewiston, Idaho

Zone 2: Outside 45 mile radius of Spokane, Moses Lake,  
 Pasco, Washington; Lewiston, Idaho

#### POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1A: Boat Operator; Crush Feeder; Oiler; Steam Cleaner

GROUP 1: Bit Grinders; Bolt Threading Machine; Compressors  
 (under 2000 CFM, gas, diesel, or electric power); Deck  
 Hand; Drillers Helper (assist driller in making drill rod  
 connections, service drill engine and air compressor,  
 repair drill rig and drill tools; drive drill support truck  
 to and one the job site, remove drill cuttings from around  
 bore hole and inspect drill rig while in operation);  
 Fireman & Heat Tender; Grade Checker; Hydro- seeder,  
 Mulcher, Nozzleman; Oiler Driver, & Cable Tender, Mucking  
 Machine; Pumpman; Rollers, all types on subgrade, including  
 seal and chip coatings (farm type, Case, John Deere &  
 similar, or Compacting Vibrator), except when pulled by  
 Dozer with operable blade; Welding Machine

GROUP 2: A-frame Truck (single drum); Assistant Refrigeration  
 Plant (under 1000 ton); Assistant Plant Operator, Fireman  
 or Pugmixer (asphalt); Bagley or Stationary Scraper; Belt  
 Finishing Machine; Blower Operator (cement); Cement Hog;  
 Compressor (2000 CFM or over, 2 or more, gas diesel or  
 electric power); Concrete Saw (multiple cut); Distributor  
 Leverman; Ditch Witch or similar; Elevator Hoisting  
 Materials; Dope Pots (power agitated); Fork Lift or Lumber  
 Stacker, hydra-lift & similar; Gin Trucks (pipeline);  
 Hoist, single drum; Loaders (bucket elevators and  
 conveyors); Longitudinal Float; Mixer (portable-concrete);  
 Pavement Breaker, Hydra-Hammer & similar; Power Broom;  
 Railroad Ballast Regulation Operator (self-propelled);  
 Railroad Power Tamper Operator (self-propelled); Railroad  
 Tamper Jack Operator (self-propelled); Spray Curing Machine

(concrete); Spreader Box (self-propelled); Straddle Buggy (Ross & similar on construction job only); Tractor (Farm type R/T with attachment, except Backhoe); Tugger Operator

GROUP 3: A-frame Truck (2 or more drums); Assistant Refrigeration Plant & Chiller Operator (over 1000 ton); Backfillers (Cleveland & similar); Batch Plant & Wet Mix Operator, single unit (concrete); Belt-Crete Conveyors with power pack or similar; Belt Loader (Kocal or similar); Bending Machine; Bob Cat; Boring Machine (earth); Boring Machine (rock under 8 inch bit) (Quarry Master, Joy or similar); Bump Cutter (Wayne, Saginaw or similar); Canal Lining Machine (concrete); Chipper (without crane); Cleaning & Doping Machine (pipeline); Deck Engineer; Elevating Belt-type Loader (Euclid, Barber Green & similar); Elevating Grader-type Loader (Dumora, Adams or similar); Generator Plant Engineers (diesel or electric); Gunnite Combination Mixer & Compressor; Locomotive Engineer; Mixermobile; Mucking Machine; Posthole Auger or Punch; Pump (grout or jet); Soil Stabilizer (P & H or similar); Spreader Machine; Tractor (to D-6 or equivalent) and Traxcavator; Traverse Finish Machine; Turnhead Operator

GROUP 4: Concrete Pumps (squeeze-crete, flow-crete, pump-crete, Whitman & similar); Curb Extruder (asphalt or concrete); Drills (churn, core, calyx or diamond)(Operate drilling machine, drive or transport drill rig to and on job site and weld well casing); Equipment Serviceman, Greaser & Oiler; Hoist (2 or more drums or Tower Hoist); Loaders (overhead & front-end, under 4 yds. R/T); Refrigeration Plant Engineer (under 1000 ton); Rubber-tired Skidders (R/T with or without attachments); Surface Heater & Planer Machine; Trenching Machines (under 7 ft. depth capacity); Turnhead (with re-screening); Vacuum Drill (reverse circulation drill under 8 inch bit)

GROUP 5: Backhoe (under 45,000 gw); Backhoe and Hoe Ram (under 3/4 yd.); Carrydeck & boom truck (under 25 tons); Cranes (25 tons & under); Derricks & Stifflegs (under 65 tons); Drilling Equipment (8 inch bit & over) (Robbins, reverse circulation & similar)(operates drill machine, drive or transport drill rig to and on job site and weld well casing); Hoe Ram; Piledriving Engineers; Paving (dual drum); Railroad Track Liner Operator (self-propelled); Refrigeration Plant Engineer (1000 tons & over); Signalman (Whirleys, Highline Hammerheads or similar)

GROUP 6: Asphalt Plant Operator; Automatic Subgrader (Ditches & Trimmers) (Autograde, ABC, R.A. Hansen & similar on grade wire); Backhoe (45,000 gw and over to 110,000 gw); Backhoes & Hoe Ram (3/4 yd. to 3 yd.); Batch Plant (over 4 units); Batch & Wet Mix Operator (multiple units, 2 & incl. 4); Blade Operator (Motor Patrol & Attachments, Athey & Huber); Boom Cats (side); Cableway Controller (dispatcher); Clamshell Operator (under 3 yds.); Compactor (self-propelled with blade); Concrete Pump Boom Truck; Concrete Slip Form Paver; Cranes (over 25 tons including 45

tons), all attachments including clamshell, dragline); Crusher, Grizzle & Screening Plant Operator; Dozer, 834 R/T & similar; Draglines (under 3 yds.); Drill Doctor; Heavy Duty Mechanic; Heavy Duty Welder; Loader Operator (front-end & overhead, 4 yds. incl. 8 yds.), Multiple Dozer Units with single blade; Paving Machine (asphalt and concrete); Quad-Track or similar equipment; Rollerman (finishing asphalt pavement); Roto Mill (pavement grinder); Scrapers, all, all rubber tired; Screed Operator; Shovel (under 3 yds.); Tractors (D-6 & equivalent & over); Trenching Machines (7 ft. depth & over); Tug Boat Operator; Vactor Guzzler, Super Sucker

GROUP 7: Backhoe (over 110,000 gw); Backhoes & Hoe Ram (3 yds. & over ); Blade (finish & bluetop), Automatic, CMI, ABC, Finish Athey & Huber & similar when used as automatic; Cableway Operators; Clamshell Operator (3 yds. & over); Cranes (over 45 tons to but not including 85 tons), all attachments including clamshell and dragline; Derricks and Stifflegs (65 tons and over); Draglines (3 yds. & over); Elevating Belt (Holland type); Heavy Equipment Robotics Operator; Loader (360 degree revolving Koehring Scooper or similar); Loaders (overhead & front-end, over 8 yds. to 10 yds.); Rubber-tired Scrapers (multiple engine with three or more scrapers); Shovels (3 yds. & over); Whirleys & Hammerheads, ALL

GROUP 8: Cranes (85 tons and over, and all climbing, overhead, rail and tower), all attachments including clamshell, dragline; Loaders (overhead and front-end, 10 yards and over); Helicopter Pilot

BOOM PAY: (All Cranes, Including Tower)

180 ft to 250 ft                   \$.30 over scale

Over 250 ft                       \$.60 over scale

NOTE: In computing the length of the boom on Tower Cranes, they shall be measured from the base of the tower to the point of the boom.

HAZMAT: Anyone working on HAZMAT jobs, working with supplied air shall receive \$1.00 an hour above classification.

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IRON0014-008 07/01/2003

	Rates	Fringes
Ironworker.....	\$ 26.32	12.45

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LABO0001-005 06/01/2004

DOUGLAS COUNTY WHICH LIES WEST OF THE 120TH MERIDIAN

	Rates	Fringes
Laborers:		
ZONE 1:		
GROUP 1.....	\$ 14.70	7.70
GROUP 2.....	\$ 17.02	7.70
GROUP 3.....	\$ 18.74	7.70
GROUP 4.....	\$ 19.22	7.70
GROUP 5.....	\$ 19.58	7.70

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):

ZONE 2 - \$ .70

ZONE 3 - \$1.00

BASE POINTS: CHELAN, SUNNYSIDE, WENATCHEE, AND YAKIMA

ZONE 1 - Projects within 25 radius miles of the respective city hall

ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall

ZONE 3 - More than 45 radius miles from the respective city hall

#### LABORERS CLASSIFICATIONS

GROUP 1: Landscaping and Planting; Watchman; Window Washer/Cleaner (detail clean-up, such as but not limited to cleaning floors, ceilings, walls, windows, etc., prior to final acceptance by the owner)

GROUP 2: Batch Weighman; Crusher Feeder; Fence Laborer; Flagman; Pilot Car

GROUP 3: General Laborer; Air, Gas, or Electric Vibrating Screed; Asbestos Abatement Laborer; Ballast Regulator Machine; Brush Cutter; Brush Hog Feeder; Burner; Carpenter Tender; Cement Finisher Tender; Change House or Dry Shack; Chipping Gun (under 30 lbs.); Choker Setter; Chuck Tender; Clean-up Laborer; Concrete Form Stripper; Curing Laborer; Demolition (wrecking and moving including charred material); Ditch Digger; Dump Person; Fine Graders; Firewatch; Form Setter; Gabian Basket Builders; Grout Machine Tender; Grinders; Guardrail Erector; Hazardous Waste Worker (Level C); Maintenance Person; Material Yard Person; Pot Tender; Rip Rap Person; Riggers; Scale Person; Sloper Sprayer; Signal Person; Stock Piler; Stake Hopper; Toolroom Man (at job site); Topper-Tailer; Track Laborer; Truck Spotter; Vinyl Seamer

GROUP 4: Cement Dumper-Paving; Chipping Gun (over 30 lbs.); Clary Power Spreader; Concrete Dumper/Chute Operator; Concrete Saw Operator; Drill Operator (hydraulic, diamond, aiartrac); Faller and Bucker Chain Saw; Grade Checker and Transit Person; Groutmen (pressure) including post tension beams; Hazardous Waste Worker (Level B); High Scaler; Jackhammer; Laserbeam Operator; Manhole Builder-Mudman; Mortarman and Hodcarrier; Nozzleman (concrete pump, green cutter when using combination of high pressure air and water on concrete and rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster); Pavement Breaker; Pipe Layer and Caulker; Pipe Pot Tender; Pipe Reliner (not insert type); Pipe Wrapper; Power Jacks; Railroad Spike Puller-Power; Raker-Asphalt; Rivet Buster; Rodder; Sloper (over 20 ft); Spreader (concrete); Tamper and Similar electric, air and glas operated tool; Timber Person-sewer (lagger shorer and cribber); Track Liner Power; Tugger Operator; Vibrator; Well Point Laborer

GROUP 5: Caisson Worker; Miner; Powderman; Re-Timberman; Hazardous Waste Worker (Level A).

ALL COVERED COUNTIES (EXCLUDING DOUGLAS COUNTY WEST OF THE  
120TH MERIDIAN)

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 15.50	6.80
GROUP 2.....	\$ 18.50	6.80
GROUP 3.....	\$ 18.78	6.80
GROUP 4.....	\$ 19.04	6.80
GROUP 5.....	\$ 19.31	6.80
GROUP 6.....	\$ 21.23	6.80
LABORERS CLASSIFICATIONS		
GROUP 1: Flagman; Landscape Laborer; Scaleman; Traffic Control Maintenance Laborer (to include erection and maintenance of barricades, signs, and relief of flagperson); Window Washer/Cleaner (detail cleanup, such as, but not limited to cleaning floors, ceilings, walls, windows, etc. prior to final acceptance by the owner)		
GROUP 2: Asbestos Abatement Worker; Brush Hog Feeder; Carpenter Tender; Cement Handler; Cleanup Laborer; Concrete Crewman (to include stripping of forms, hand operating jacks on slip form construction, application of concrete curing compounds, pumpcrete machine, signaling, handling the nozzle of squeezcrete or similar machine, 6 inches and smaller); Confined Space Attendant; Concrete Signalman; Crusher Feeder; Demolition (to include cleanup, burning, loading, wrecking and salvage of all material); Dumpman; Fence Erector; Firewatch; Form Cleaning Machine Feeder, Stacker; General Laborer; Grout Machine Header Tender; Guard Rail (to include guard rails, guide and reference post, sign posts and right-of-way markers); Hazardous Waste Worker, Level D (no respirator is used and skin protection is minimal); Miner, Class "A" (to include all bull gang, concrete crewman, dumpman and pumpcrete crewman, including distributing pipe, assembly & dismantle, and nipper); Nipper; Riprap Man; Sandblast Tailhoseman; Scaffold Erector (wood or steel); Stake Jumper; Structural Mover (to include separating foundation, preparation, cribbing, shoring, jacking, and unloading of structures); Tailhoseman (water nozzle); Timber Buckler and Faller (by hand); Track Laborer (RR); Truck Loader; Well-Point Man; All Other Work		
Classifications Not Specially Listed Shall be Classified As General Laborer		
GROUP 3: Asphalt Roller, walking; Cement Finisher Tender; Concrete Saw, walking; Demolition Torch; Dope Pot Firemen, non- mechanical; Driller Tender (when required to move and position machine); Form Setter, Paving; Grade Checker using level; Hazardous Waste Worker, Level C (uses a chemical "splash suit" and air purifying respirator); Jackhammer Operator; Miner, Class "B" (to include brakeman, finisher, vibrator, formsetter); Nozzleman (to include squeeze and flo-crete nozzle); Nozzleman, water, air or steam; Pavement Breaker (under 90 lbs.); Pipelayer, corrugated metal culvert; Pipelayer, multi-plate; Pot Tender; Power Buggy		

Operator; Power Tool Operator, gas, electric, pneumatic;  
 Railroad Equipment, power driven, except dual mobile power  
 spiker or puller; Railroad Power Spiker or Puller, dual  
 mobile; Rodder and Spreader; Tamper (to include operation  
 of Barco, Essex and similar tampers); Trencher, Shawnee;  
 Tugger Operator; Wagon Drills; Water Pipe Liner;  
 Wheelbarrow (power driven)

GROUP 4: Air and Hydraulic Track Drill; Asphalt Raker; Brush  
 Machine (to include horizontal construction joint cleanup  
 brush machine, power propelled); Caisson Worker, free air;  
 Chain Saw Operator and Faller; Concrete Stack (to include  
 laborers when working on free standing concrete stacks for  
 smoke or fume control above 40 feet high); Gunnite (to  
 include operation of machine and nozzle); Hazardous Waste  
 Worker, Level B (uses same respirator protection as Level  
 A. A supplied air line is provided in conjunction with a  
 chemical "splash suit"); High Scaler; Laser Beam Operator  
 (to include grade checker and elevation control);  
 Miner, Class C (to include miner, nozzleman for concrete,  
 laser beam operator and rigger on tunnels); Monitor  
 Operator (air track or similar mounting); Mortar Mixer;  
 Nozzleman (to include jet blasting nozzleman, over 1,200  
 lbs., jet blasting machine power propelled, sandblaster  
 nozzle); Pavement Breaker (90 lbs. and over); Pipelayer (to  
 include working topman, caulker, collarman, jointer,  
 mortarman, rigger jacker, shorer, valve or meter installer,  
 tamper); Pipewrapper; Plasterer Tenders; Vibrators (all)  
 GROUP 5 - Drills with Dual Masts; Hazardous Waste Worker,  
 Level A, (utilizes a fully encapsulated suit with a  
 self-contained breathing apparatus or a supplied air line);  
 Miner Class "D" (to include raise and shaft miner, laser  
 beam operator on raises and shafts)

GROUP 6 - Powderman

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 \* LABO0238-007 06/01/2004

	Rates	Fringes
Hod Carrier.....	\$ 21.05	6.80

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 \* PAIN0005-014 07/01/2003

ADAMS, ASOTIN, COLUMBIA, DOUGLAS, FERRY, GARFIELD, GRANT,  
 LINCOLN, OKANOGAN, PEND OREILLE, **STEVENS**, WALLA WALLA AND  
 WHITMAN COUNTIES

	Rates	Fringes
Painter		
Brush, Roller, Striping,		
Steam-cleaning and Spray....	\$ 18.97	6.22
*\$.70 shall be paid over and above the basic wage rates listed for work on swing stages and high work of over 30 feet.		

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 \* PAIN0054-002 10/01/2003

	Rates	Fringes
Carpet, Linoleum & Soft Tile		
New construction,		

alteration and repair of  
 one (1) story **building**  
 with floor spaces not to  
 exceed 12 feet in width.....\$ 14.50 3.97  
 All Other Work.....\$ 14.50 3.97

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 \* PAIN0054-007 09/01/2003

	Rates	Fringes
Glazier.....	\$ 18.00	5.26

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 \* PLAS0072-003 06/01/2003

ZONE 1:

	Rates	Fringes
Cement Mason.....	\$ 21.51	7.03
Zone Differential (Add to Zone 1 rate):	Zone 2: \$2.00	
BASE POINTS: Spokane, Pasco, Moses Lake, Lewiston		
Zone 1: 0 - 45 radius miles from the main post office		
Zone 2: Over 45 radius miles from the main post office		

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 \* PLUM0032-004 01/01/2004

DOUGLAS AND OKANOGAN COUNTIES WHICH LIES WEST OF THE 120TH  
 MERIDIAN

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 26.38	11.68

-----  
 \* PLUM0044-002 06/01/2003

ASOTIN (CLARKSTON ONLY), FERRY (EASTERN PART), LINCOLN (EASTERN  
 PART), PEND ORIELLE, AND **STEVENS**, WHITMAN COUNTIES

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 26.01	10.74

-----  
 \* PLUM0598-004 06/01/2004

ADAMS, ASOTIN (EXCLUDING THE CITY OF CLARKSTON), COLUMBIA,  
 DOUGLAS (WHICH LIES EAST OF THE 120TH MERIDIAN), FERRY (WESTERN  
 PART), GARFIELD, GRANT, LINCOLN (WESTERN PART), OKANOGAN (WHICH  
 LIES EAST OF THE 120TH MERIDIAN) AND WALLA WALLA COUNTIES

	Rates	Fringes
Plumber.....	\$ 31.57	15.25

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 \* ROOF0189-005 07/01/2003

	Rates	Fringes
Roofer.....	\$ 19.95	6.40

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 \* SHEE0066-006 06/01/2003

ADAMS, ASOTIN, DOUGLAS, FERRY, GRANT, LINCOLN, OKANOGAN, PEND  
 OREILLE, **STEVENS**, AND WHITMAN COUNTIES

	Rates	Fringes
Sheet metal worker.....	\$ 21.13	8.81

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 \* SHEE0066-007 07/01/2004

COLUMBIA, GARFIELD, AND WALLA WALLA COUNTIES

	Rates	Fringes
Sheet metal worker.....	\$ 25.26	11.83



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 WELDERS - Receive rate prescribed for craft performing  
 operation to which welding is incidental.  
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Unlisted classifications needed for work not included within  
 the scope of the classifications listed may be added after  
 award only as provided in the labor standards contract clauses  
 (29CFR 5.5 (a) (1) (ii)).  
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In the listing above, the "SU" designation means that rates  
 listed under the identifier do not reflect collectively  
 bargained wage and fringe benefit rates. Other designations  
 indicate unions whose rates have been determined to be  
 prevailing.  
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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can  
 be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on  
 a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests  
 for summaries of surveys, should be with the Wage and Hour  
 Regional Office for the area in which the survey was conducted  
 because those Regional Offices have responsibility for the  
 Davis-Bacon survey program. If the response from this initial  
 contact is not satisfactory, then the process described in 2.)  
 and 3.) should be followed.

With regard to any other matter not yet ripe for the formal  
 process described here, initial contact should be with the  
 Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
 Wage and Hour Division  
 U.S. Department of Labor  
 200 Constitution Avenue, N.W.  
 Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an  
 interested party (those affected by the action) can request  
 review and reconsideration from the Wage and Hour Administrator  
 (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
 U.S. Department of Labor  
 200 Constitution Avenue, N.W.  
 Washington, DC 20210

The request should be accompanied by a full statement of the  
 interested party's position and by any information (wage  
 payment data, project description, area practice material,  
 etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an  
 interested party may appeal directly to the Administrative  
 Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

A Deliverable to the  
U.S. Immigration & Naturalization Service

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**INS Service Technology Alliance  
Resources Systems Management/Integration  
(INS STARS SM/I) Contract**



**TECHNICAL PAPER  
INS STRUCTURED CABLING STANDARDS  
DATA COMMUNICATIONS SUPPORT**

Task Order No.: 00-SM/I-SID-306: Data Communications Support

**FINAL**

January 31, 2001  
SMI-0039-SID-306-JRL-20005A

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## **1.0 INTRODUCTION**

### **1.1 Purpose**

This document has been prepared for the U.S. Immigration and Naturalization Service (INS) with the specific purpose of setting standards for structured wire plants in support of local area network (LAN) and voice connectivity that will function as follows:

- Accommodate the functional requirements of present and future information services
- Support a multi-product and multi-vendor environment
- Facilitate the planning and installation of cabling systems that will support the diverse communication needs of building occupants
- Ensure uniformity of structured wiring and hardware infrastructure installations in all INS facilities nationwide

The primary focus of this document is to define the standards for material, infrastructure, design, installation, and certification with respect to structured cabling systems for INS facilities. The conversion of sites that have cabling in place to this standard will largely depend upon budgetary and time constraints.

This document shall replace, modify, or otherwise supercede previous releases of these standards. For questions or comments regarding this document, contact the INS Data Communication Branch (DCB) Installation Manager at (202) 307-5723.

An electronic version of this document resides in the INS Intranet Enterprise Library, available on the Office of Information Management (OIRM) Web site.

### **1.2 Background**

The INS is a component of the U.S. Department of Justice (DOJ). INS is responsible for enforcing immigration laws and for providing immigration services. There are more than 960 INS border patrol sectors, stations, district offices, sub-offices, ports of entry, and checkpoints located throughout the United States and its territories. Because of increasing demands on Service resources, INS personnel must be able to share information rapidly and efficiently in order to succeed in fulfilling the Service mission.

In addition to this document, which establishes the cabling standards for INS facilities, other documents are being developed that provide additional related information such as:

- Enterprise LAN standards
- Enterprise wide area network (WAN) standards
- Workstation and server configurations
- Voice communications standards

## **1.3 Scope**

### **1.3.1 System**

Typical structured cabling systems include the following elements:

- Horizontal cable
- Horizontal cross-connects
- Transition point (optional)
- Main cross-connect (MC)
- Intermediate cross-connect
- Backbone cabling, intra and inter
- Workstation locations or information management outlets (IMO)
- Remote wiring closet (RWC)
- Main distribution frame (MDF)
- Entrance facility (EF)
- Grounding
- Administration

### **1.3.2 Documentation**

This document is intended to address the following specifications and installation practices related to structured cable plant installation:

- Recognized media
- Closet requirements, environmental and design
- Distribution cabling
- Cabling specifications and limits
- Installation practices
- Performance testing
- Supporting documentation

## **2.0 NETWORK CABLE PLANT OBJECTIVES**

The objective of this network approach is to provide the INS with a standardized, cost-effective cable plant infrastructure that will accommodate present and future voice, video, and data requirements. Workstation cabling infrastructure shall support bandwidth demands from 10 Megabits per second (Mbps) to Gigabit (Gb) speeds. Backbone cable infrastructure shall support bandwidth demands from Gigabit speeds and beyond. The installation of the cable plant infrastructure shall comply with local codes, as well as, industry and Federal standards.



### **3.0 STRUCTURED CABLE PLANT DESIGN**

The network cable plant shall utilize the following cable distribution methods to support connectivity throughout the building:

- Horizontal workstation cabling, which will connect the user workstation, or information management outlet (IMO) to the nearest RWC
- Where appropriate, Intra and Inter-building copper backbone cable, that provides connectivity between wiring centers and the MDF
- Work zone distribution cabling for open office space
- Fiber optic intra and inter-building backbone cable, that also provides connectivity between wiring centers and the MDF

#### **3.1 Structured Cable Plant Approach**

This section will describe the approach to structured cabling, identify and describe the various cable types, and provide detailed cable specifications for cable plant installation. These are minimum specifications for new cable plant installations or major renovations. These specifications follow the American National Standards Institute (ANSI)/Telecommunications Industries Association (TIA)/Electronic Industries Association (EIA) recommendations, ANSI/TIA/EIA Addendum 5, and in addition, provide specific guidelines unique to INS. Detailed cable plant material specifications and overall minimum characteristics are provided in Section 4.

#### **3.2 Horizontal Workstation Cabling**

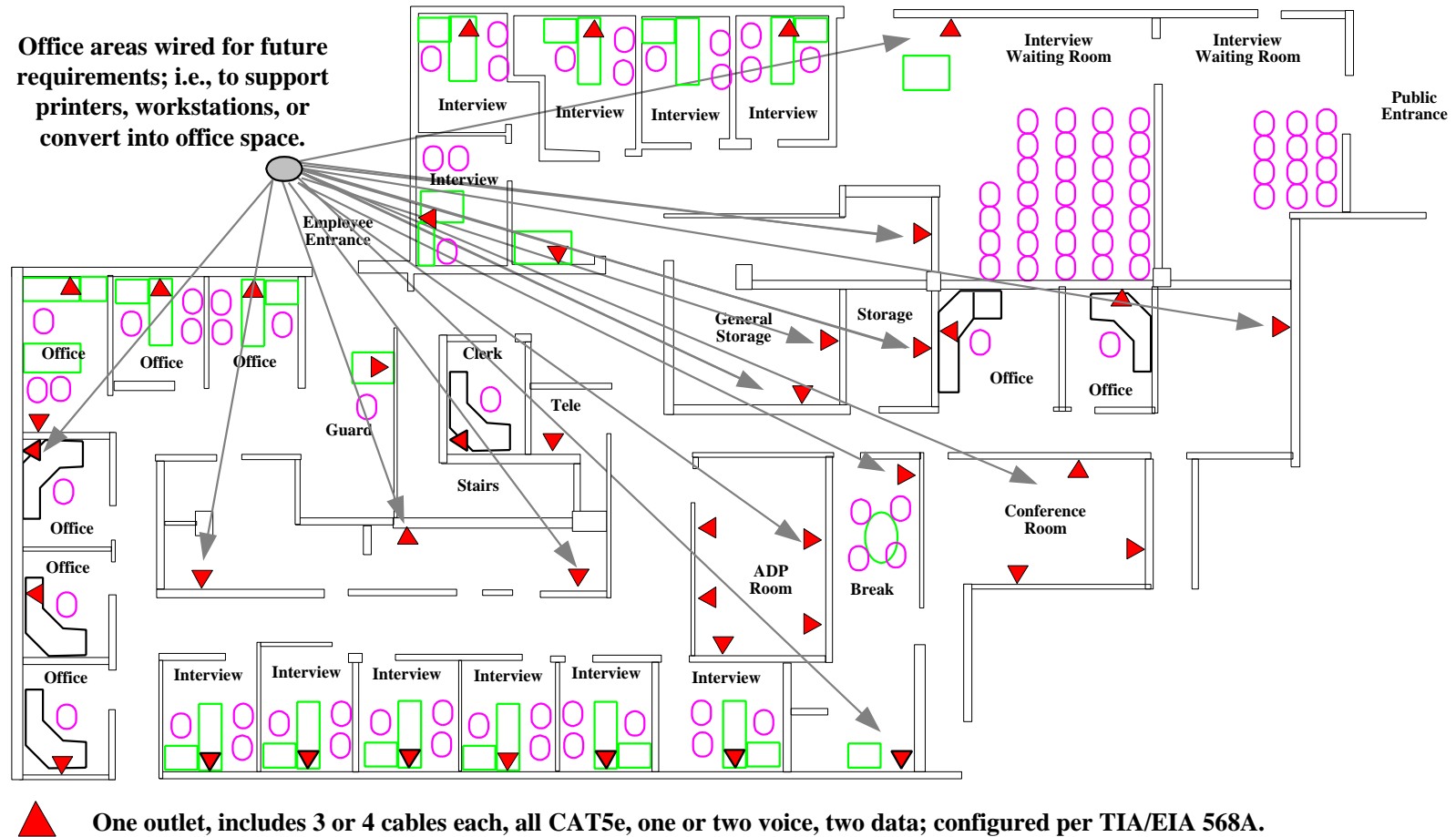
All end-user workstation locations, whether occupied or vacant, shall be cabled to the nearest wiring center. Also, storage rooms, conference rooms and similar space not designated as offices shall be cabled to allow for office expansion, as shown in Exhibit 1.

In general, each RWC equipment rack shall be capable of supporting a maximum of 288 data cables. A second rack is required to support up to 288 voice cables, providing a consolidated voice and data closet. The combined racks provide ample space for a total combined 144 workstation locations (voice and data). In smaller installations, typically less than 72 workstation locations, a single equipment rack will suffice for both voice and data termination.

To comply with ANSI/TIA/EIA 568A specification distance limits, the cable run from any user workstation location to the nearest wiring center shall not exceed 100 meters (328 feet). The actual length of a cable run is defined as the total combined length of the station cord, workstation cable, and patch-panel cable. When planning or designing office space, communications closets should be located within 90 meters of any workstation outlet. This design approach allows the addition of patch cables and workstation cords to connect devices, without exceeding the ANSI/TIA/EIA 568A specification distance limits.

In a building not exceeding two stories, horizontal workstation cabling may be installed to a single point, such as a computer room, wiring center, or the MDF. This scenario may be used in place of a creating an RWC, thus eliminating any need for backbone cabling systems. This installation method should be utilized when cost is a constraint and the length of the cable run does not exceed the specified distance limits.

**Exhibit 1: Typical Office Cable Planning**



Each user workstation location shall be cabled with two 4-pair, unshielded twisted pair (UTP), Category (CAT) 5e copper cables for data transmission, that will be labeled as "Data A" and "Data B." The cable shall have a fire-retardant, plenum rated jacket.

Each workstation cable that is routed through a suspended ceiling area shall be secured in a manner that will keep all cable plant off of any suspended ceiling tiles, sprinkler systems, ceiling suspension hangers, and adhere to local and Federal building codes. Cable plant installed in plenum environments should provide enough slack to facilitate minor construction modifications, or cable re-locations, without the need to install new cable altogether. This installation approach normally requires approximately 20 feet of cable slack, secured in an appropriate manner, to ensure cable is minimized from radio frequency interference (RFI) and electro-magnetic interference (EMI) sources. However, installed cable shall at no time exceed the overall specifications for total lobe length of 100 meters in accordance with the ANSI/TIA/EIA standards. If required, an independent suspension system shall be installed for the cable plant, to keep the cables off of and away from the existing ceiling grid and fixtures.

If the building being cabled is a new installation, cable installation shall include voice wiring in addition to data. The workstation location shall be cabled with a minimum of one 4-pair, UTP, CAT 5e cable for voice or modem/fax services. It is recommended that two voice cables be installed rather than a single voice cable; however, budget and overall technical requirements will determine the need on a case-by-case basis. For planning and budgeting, two voice cables should be used in the design phase. Voice cable(s) shall be labeled "Voice A" or "Voice A" and "Voice B" while adhering to the labeling conventions as described in Section 12.

When routed above a suspended ceiling, horizontal cables should be routed down the inside of walls ("fished") wherever possible to ensure no exposed cable is visible. If walls cannot be fished, surface mounted (external) raceway may be used to route the cable from the ceiling to the information outlet and installed in a surface-mounted outlet box. All attempts should be made to ensure no horizontal cable is exposed within the building area, providing a neat, professional installation. Horizontal cables shall never be exposed to outdoor elements without being protected in proper conduit/raceway systems and have proper lightning and bonding protection installed.

Optical fiber cable can also be used for horizontal workstation connectivity when the following conditions exist:

- Distance requirements exceed the 100 meter cable-length specification
- Known high bandwidth/security requirements that exceed copper cable limitations and a business case supports the installation
- Space inside or outside of the walls to support the minimum fiber cable bend radius
- Severe EMI or RFI in the copper cable plant
- Adequate funding
- Proposed fiber optic to the desktop is approved by the DCB

If optical fiber cables are used for workstation connectivity, each workstation location shall be cabled with a 4-strand, 62.5/125 micrometer ( $\mu\text{m}$ ), graded index, multi-mode optical fiber cable

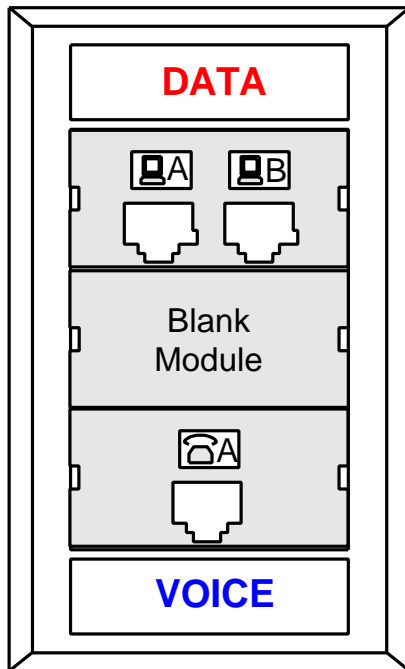
with proper coating to meet local fire and building codes, whereas plenum is recommended. The cable shall be labeled as described in Section 12 of this document.

### 3.3 Workstation Outlets

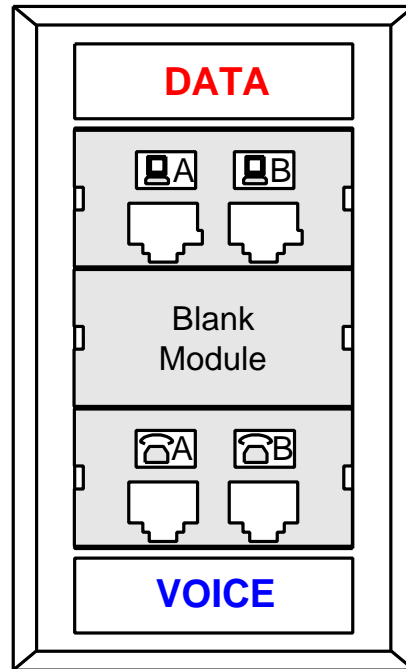
Each workstation area shall use a standard IMO (faceplate) that can support a minimum of three dual-connection interfaces (remote jack [RJ]-45, ST, SC, or MTRJ connectors). Regardless of the installation contractor, all voice and data cable shall utilize a single Information Outlet. Information outlets must be capable of future growth without the need to replace the entire Information Outlet. Information outlets can be either single gang or dual gang standard size, sizing will be determined by number of cables being installed. The data cables shall be installed on two RJ-45 keyed jacks.

**Exhibit 2: Workstation (IMO) Faceplates without Optical Fiber Cables, Single Gang**

**Single Gang Flush  
Mount Faceplate, Single  
Voice, Dual Data**

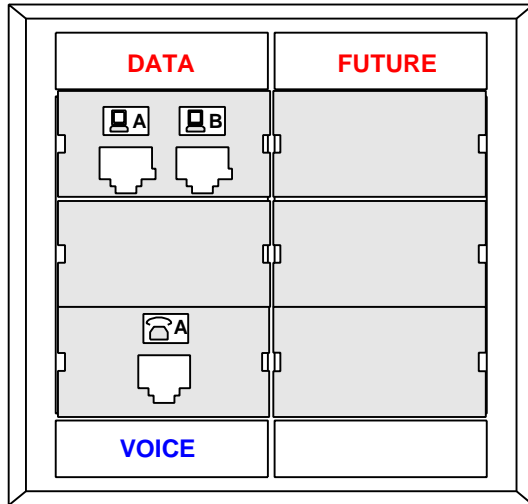


**Single Gang Flush  
Mount Faceplate, Dual  
Voice and Data**

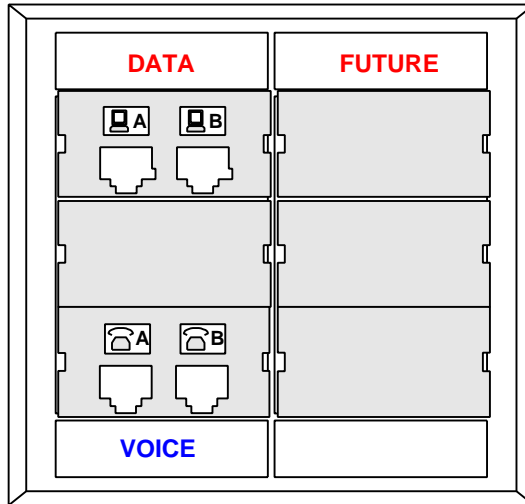


### Exhibit 3: Workstation (IMO) Faceplates without Optical Fiber Cables, Double Gang

**Double Gang Flush Mount Faceplate  
Single Voice, dual data**



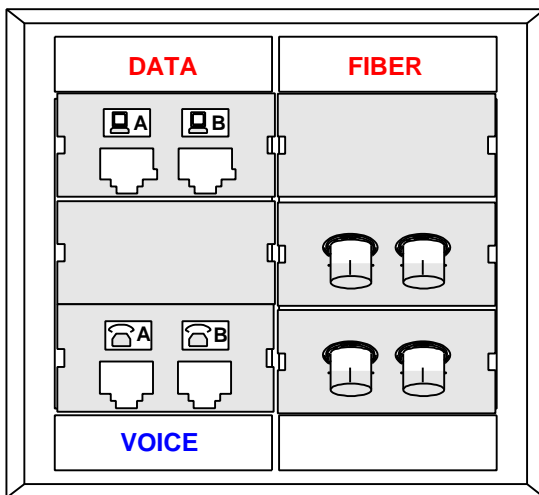
**Double Gang Flush Mount Faceplate  
Dual Voice, dual data**



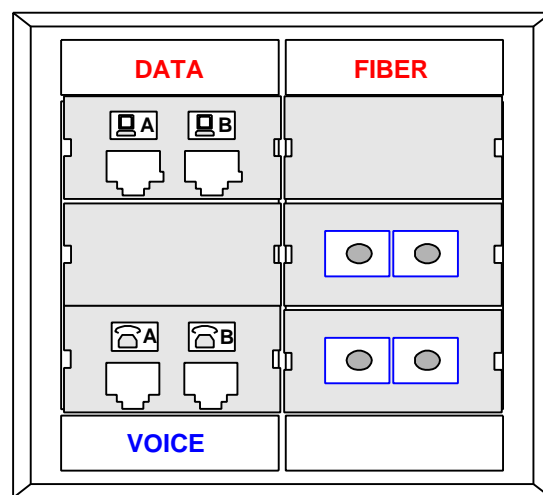
Where fiber-optic cable is installed to the desktop, the corresponding IMO faceplate shall provide space to install at least four RJ-45 jacks and at least two ST, SC, or MTRJ optical fiber connectors (see Exhibit 4).

### Exhibit 4: Workstation Faceplate with Optical Fiber Cables

**Double Gang Flush Mount Faceplate  
Fiber Optic ST connectors**



**Double Gang Flush Mount Faceplate  
Fiber Optic SC connectors**



### **3.4 Backbone Cabling**

Intra and Inter-backbone cabling may consist of either or both copper and optical fiber cables and are required where there exists more than one wire center. The intra and inter-backbone shall be installed to provide structured connectivity between closets (see Exhibit 5). The installation provides a star-topology cable infrastructure that is capable of supporting high-speed and high bandwidth requirements between key resources in an enterprise building or campus environment.

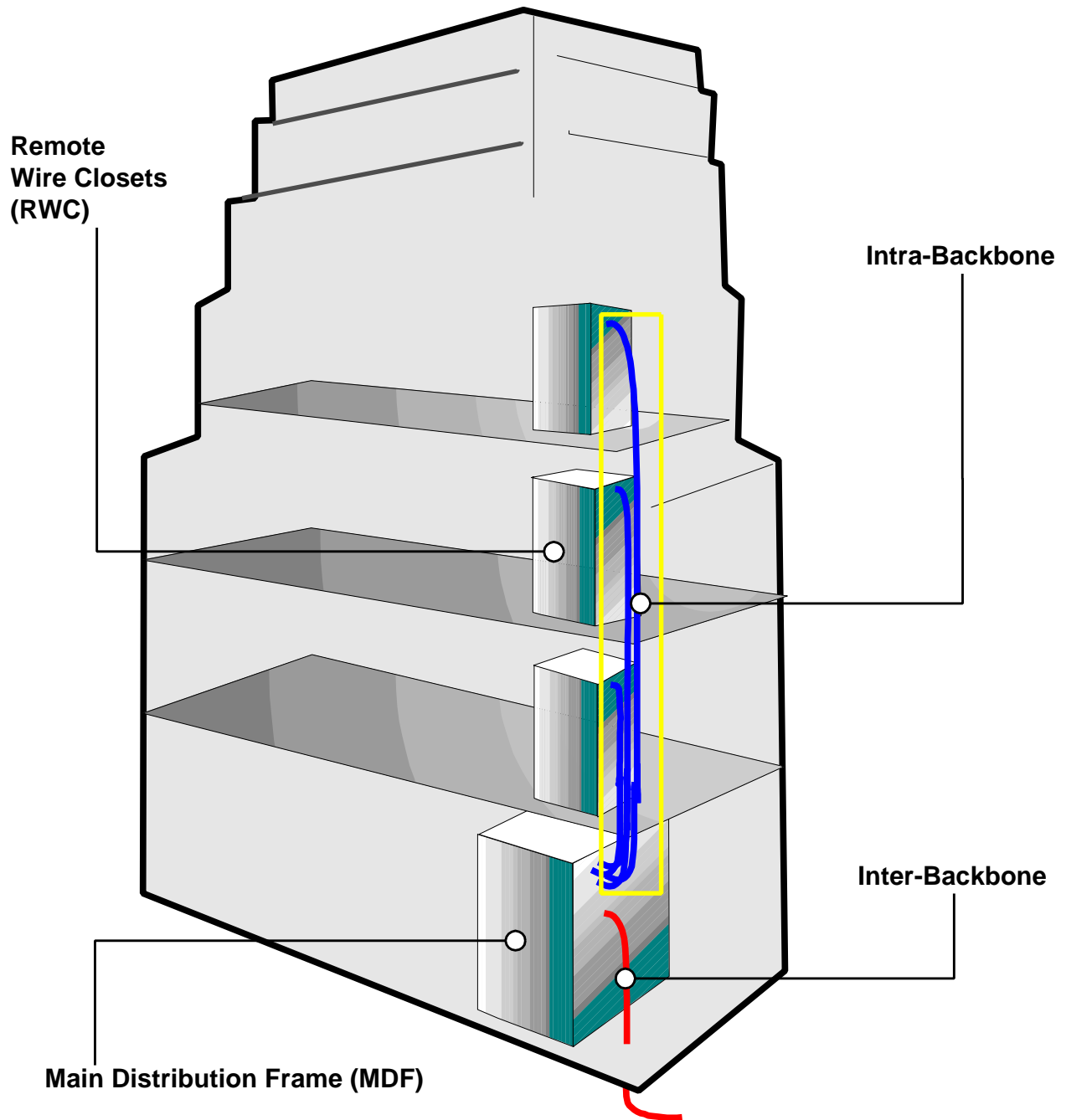
A multi-mode, single mode, or combination of fiber-optic backbone structure provides the means of interconnecting all wiring closets to the MDF in a multi-segmented environment. Optical fiber not only provides extensive bandwidth capabilities to the LAN and voice, but it also provides a solution to the distance-related problems encountered with copper cables in large installations and campus environments.

Copper backbone cabling is required to support voice services, however, the specifications and designs are determined on a site-by-site basis. This is due to the variety, funding, capacity and availability of voice services and designs. Copper backbone may also be installed to support networking services, where distance limitations do not exceed the ANSI/TIA/EIA 568-A specifications. Copper backbone cabling provides a redundant connectivity option in the event of a catastrophic fiber failure, and shall be installed where voice and data closets are physically separated.

Each remote wiring closet shall be connected to the MDF with a multi-strand, optical fiber backbone cable that runs directly from the wiring center to the MDF. All strands will be terminated with ST, SC, or MTRJ-style connectors in accordance with the ANSI/TIA/EIA standards in rack-mounted patch panels. A minimum twelve-strand fiber shall be installed in any facility providing connectivity between communications closets. It is estimated that 12 strands of multi-mode fiber will meet most of the intra and inter backbone connectivity needs currently deployed and planned for INS facilities. Considering the myriad of site functions, building designs, physical layout, application requirements and future technologies, backbone design is a critical element in the planning stages. To ensure facilities are properly engineered with respect to backbone fiber types and counts, DCB will provide engineering design in concert with local Automated Data Processing (ADP) support personnel and facilities architects. This ensures both short-term and long-term requirements are met in a cost-effective manner.

The optical fiber Intra and Inter-backbone cabling shall have one port per strand for cross-connection, and will conform to the specifications in Sections 4 and 6 of this document.

**Exhibit 5: Backbone Fiber Distribution**



## 4.0 SPECIFICATIONS

This section provides detailed component characteristics and specifications with respect to the materials used to install the structured cable plant.

### 4.1 Horizontal Cables

All cable, equipment, and materials shall meet applicable ANSI/TIA/EIA 568A, National Electrical Code (NEC) 770, Institute of Electrical and Electronics Engineers (IEEE) 802 and Underwriters Laboratory (UL) Verification Program standards. All cable equipment and materials must be manufactured by facilities that are International Organization for Standardization (ISO) 9001 registered and certified.

- Shall be CAT 5e rating in accordance with ANSI/TIA/EIA 568-A and Addendum 5 standards.
- Four-pair, 100-Ohm, 24 American Wire Gage (AWG)
- The cable should have contiguous, 2-foot segment-length markers printed on the cable jacket. The markings must also show the applicable performance CAT 5e, as well as the fire rating of the cable being installed
- The finished cable shall be 100% plenum rated in accordance with the requirements of NEC Article 800, UL 444, NFPA 262, (UL 910), and applicable Canadian Standards Association (CSA) standards.

Note: CAT 5e cable types must meet or exceed specifications listed in Exhibit 6.

**Exhibit 6: 5e Cable Specifications**

Specification	Category 5e
Frequency Range	1-100 MHz
Attenuation (maximum)	24 dB
NEXT (minimum)	30.1 dB
PSNEXT (minimum)	27.1 dB
ACR (minimum)	6.1 dB
PSACR (minimum)	3.1 dB
ELFEXT (minimum)	17.4 dB
PSELFEXT (minimum)	14.4 dB
Return Loss (minimum)	10 dB
Propagation Delay (maximum)	548 nanoseconds (ns)
Delay Skew (maximum)	50 ns

### 4.2 Information Management Outlets

- Provide ANSI/TIA/EIA symbol icons for application identification (LAN, Voice, etc)
- Provide individual label window for cable identification



- Provides a high density design
- Offers solutions for secure environments
- Must match make and model in existing facilities
- Meets or exceeds ANSI/TIA/EIA CAT-5e specifications
- Mounts to standard electrical 2 inch and 4 inch boxes
- Allows all modules (jacks) to be loaded and accessed from the front. No need to remove faceplate
- Meets all Federal Communications Commission (FCC) Part 68 specifications
- Provides standard 110D type insertion displacement connector (IDC) Printed Circuit Board (PCB) mounted connector
- Is offered in a multitude of colors
- Provides interchangeability between modules
- Offers keyed and non-keyed RJ-45 style connectors
- Offers SC, ST or MTRJ interchangeable modular fiber connectors
- Is available in the ANSI/TIA/EIA 568-A wiring configuration

### **4.3 Backbone Cabling**

Backbone cabling shall be a minimum of 12-strand multi-mode fiber optic. In limited instances, single mode fiber-optic cable may be used for distances that exceed 500 meters, in accordance with the Institute of Electrical and Electronics Engineers (IEEE) and the Gigabit Ethernet Alliance organizations. The IEEE 802.3z and IEEE 802.3ab published standards apply to gigabit Ethernet and overall specifications.

CAT 5e copper backbone cabling shall meet the same specifications as stated in Section 4.1 (Horizontal Cabling), in addition to the multi-pair construction in increments of 25, 50 and 100 pair complements. Voice copper backbone cabling is not specified in this standards document and shall be determined on a case-by-case basis. Voice copper backbone cables are not subject to the same 100 meter distance limitations as specified for networking backbone cabling which is the CAT 5e cable plant.

#### **4.3.1 Intra-Building Fiber Optics**

Specifications for fiber backbone cabling that will interconnect closets within a single building or high-rise environment are defined in this section.

##### **4.3.1.1 Multi-Mode Fiber Optics**

- 62.5/125- $\mu$ m optical fiber plenum (OFNP) or optical fiber riser (OFNR)
- Maximum Attenuation: 3.5/1.0 dB km at 850/1300 nm
- Minimum Bandwidth: 200/500 MHz km at 850/1300 nm
- Tight buffered

- Plenum or riser rated

#### **4.3.1.2 Single-Mode Fiber Optics**

- 8.3/125- $\mu$ m OFNP or OFNR
- Maximum Attenuation: 1.0/0.5 dB km at 1310/1550 nm
- Tight buffered
- Plenum or riser rated

#### **4.3.2 Inter-Building Fiber Optics**

Specifications for fiber cable that will interconnect remote buildings in a campus environment.

##### **4.3.2.1 Multi-Mode Fiber Optics**

- 62.5/125- $\mu$ m OFN, OFNP, or OFNR
- Maximum Attenuation: 3.5/1.0 dB km at 850/1300 nm
- Minimum Bandwidth: 200/500 MHz km at 850/1300 nm
- Loose Tube
- Not Rated, Plenum rated, or Riser rated

##### **4.3.2.2 Single-Mode Fiber Optics**

- 8.3/125- $\mu$ m OFN, OFNP, or OFNR
- Maximum Attenuation: 1.0/0.5 dB km at 1310/1550 nm
- Loose Tube
- Not Rated, Plenum rated, or Riser rated

#### **4.4 Patch Cables (Workstation and Patch Panel)**

- Shall conform to the ANSI/TIA/EIA CAT 5e and addendum 5 specifications
- 4-pair, UTP stranded cable
- RJ-45 connectors on both ends
- The patch cables shall be wired in accordance with the ANSI/TIA/EIA 568A specifications
- Certified by the manufacturer as compliant with the ANSI/TIA/EIA CAT 5e, addendum 5 criteria.
- Cables shall be available in a wide variety of colors and lengths

#### **4.5 Patch Panels**

- Shall conform to the ANSI/TIA/EIA CAT 5e and addendum 5 specifications
- The patch panel wiring shall be in compliance with ANSI/TIA/EIA 568A wiring standards

- Provide back wire management hardware
- Provide modular design to facilitate field repairs
- Provides standard 110D type IDC PCB mounted connector
- Available in low and high density configurations
- Meet the standard EIA-310 relay rack spacing specifications
- Provide RJ-45 interface
- Meets all FCC Part 68 specifications
- Available in 12, 24, 48, and 96 port capacities
- Match make and model within existing facilities, where possible

#### **4.6 Equipment Racks**

- Shall conform to the ANSI/TIA/EIA standards
- Conform to the standard EIA-310 mounting specification
- Provide pre-tapped 10-32 threading
- Provide a flexible modular concept
- Provide vertical wire management
- Provide floor mounting hardware except for swing gate style hardware
- Match make and model within existing facilities, where possible

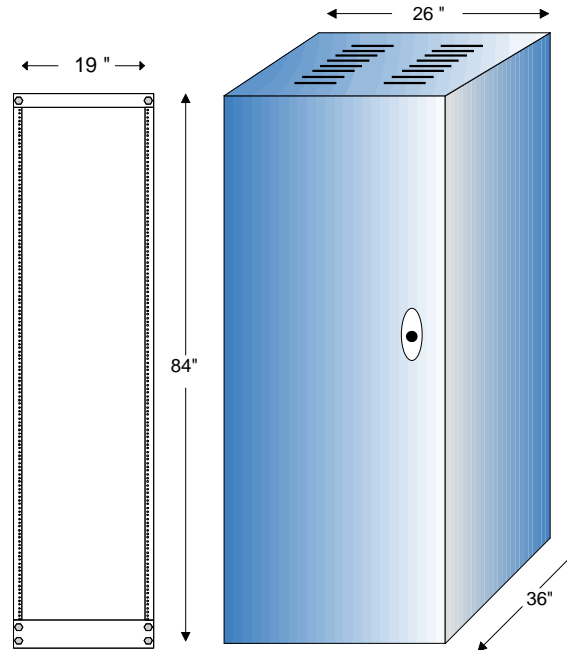
See Exhibit 7 for a typical rack and cabinet structure.

#### **4.7 Cabinets and Swing Gates**

- Shall conform to the ANSI/TIA/EIA standards
- Conform to the standard EIA-310 mounting specification
- Provide pre-tapped 10-32 threading
- Provide a flexible modular concept
- Provide vertical wire management
- Provide floor mounting hardware except for swing gate style hardware
- Match make and model within existing facilities, where possible
- Available in widths up to 26 inches or more
- Available in depths up to 36 inches or more
- Allow fan assembly installation
- Lockable and offer matching key/lock design where multiple cabinets are installed
- Are of a welded, uni-body construction

- For areas located within seismic activity, meet Zone 4 earthquake vibration test conditions in accordance with National Electrical Bell Standards (NEBS) document TR-NWT-000063, Issue 4, 1992

### Exhibit 7: Typical Rack/Cabinet Enclosures



## 5.0 COPPER CABLE INSTALLATION SPECIFICATIONS

This section details the specifications that are to be used when installing all copper cabling. All work shall be ANSI/TIA/EIA 568A, ANSI/TIA/EIA 569, ANSI/TIA/EIA 606, NEC 770 and IEEE 802 standard specification quality (as applicable).

### 5.1 Horizontal Cables

These are cables installed from a typical workstation location back to a central point within a building or facility. These cables connect the IMO (jack), back to a central point, the closet. The closet may be the MDF or an RWC. These cables shall be installed in compliance with ANSI/TIA/EIA, building and industry practices. Cables should never be exposed nor create any safety hazards for the public.

All copper cables shall be positioned at a minimum distance of 4 inches from any EMI device (such as a light ballast, electrical motor, or power line). If contact is unavoidable (as in modular furniture), the copper cables shall not run more than 5 feet in parallel with the interference-generating medium. If traversing is necessary, all copper cables shall cross power lines and electrical conduits at a 90-degree angle to minimize interference.

Copper cables installed in a suspended ceiling environment shall at all times be self-suspended in the plenum air space by the use of a separate suspension system or installation in the building

construction frame at the top of the permanent ceiling, if it exists. At no time shall cables be secured to the suspended ceiling grid, water pipes, or electrical conduits.

All cables should be installed as far above the suspended ceiling as possible, and should be bundled together with tie-wraps at intervals no less than 6 feet unless a dedicated cable tray system is available to support the cable. The tie-wraps should not be installed so tight as to "dent" or compress the cable jacket because this could create excessive crosstalk in the cables, causing failure during the testing of the cable to meet CAT 5e specifications.

## **5.2 Patch Cables (Workstation)**

The workstation patch cable connects the end user devices (personal computer, terminals, etc.) to the IMO (jack). For most installations, these patch cables will be provided and left on-site for the deployment team or local ADP to install when setting up workstations and are not included in the overall cable plant certification. The workstation patch cable may be any length as long as the combined length of the workstation patch cable, the horizontal workstation cabling, and the patch-panel cable does not exceed 100 meters (328 feet). These cables are normally pre-constructed, certified and ordered in standard one-foot incremental lengths. If the installation vendor chooses, custom-length, certified station cables can be used.

## **5.3 Patch Cables (Panel)**

The patch-panel cable connects the horizontal cable port to the voice and data electronics within a central wire center or closet, typically a RWC or MDF. These cables are identical to the workstation cables and are pre-constructed and certified by the manufacturer. It is the cable installer's responsibility for patching all active cable locations into active ports, unless otherwise directed by the INS manager or designated representative. These cables are pre-certified by the manufacturer; therefore, it is unnecessary to include them in the cable plant certification. Wire management and organization is important to facilitate troubleshooting, repair, and documentation and, as such, there are key elements to ensure patch cords are properly installed. The following requirements shall be followed for patching workstation ports to electronics:

- The patch-panel cable may be any length, provided that the combined length of the workstation patch cable, the horizontal workstation cabling, and the patch-panel cable does not exceed 100 meters (328 feet).
- If the installation vendor chooses, custom-length, certified station cables can be used.
- Patch cables must be labeled and matching on both ends, in a standard one-up numeric convention. An example would be a closet that has 100 active workstations, thus 100 patch cables are installed, one for each active node, starting with cable identification (ID) number one and ending with ID number 100. Any support personnel would be able to view the station patch panel and electronics equipment to determine which specific port a particular station is connected.
- Patch cable numbering shall be affixed to both ends of each patch cord approximately one inch from the terminator or mod plug.
- Label IDs must be legible and produced with indelible ink. The preferred method is a printed label. Installers must avoid the use of materials that will distract from the appearance of the installation, or any temporary marking

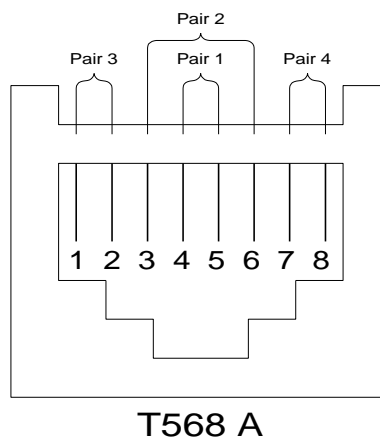
- Ensure patch cables are installed in a manner that does not require support personnel to “tug” or “trace” cables in order to determine the active port.
- Cables must be dressed utilizing available horizontal and vertical wire management
- Patch cables should provide a neat and organized appearance, eliminating large bundles of cables in single locations, preventing tangles and using incorrect , or oversized cables that produce excess slack
- Cables shall never exceed the minimum bend radius or have kinks or nicks in accordance with the ANSI/TIA/EIA specifications
- Cables should utilize left and right vertical wire management to reduce cable patch congestion produce and even cable distribution within a given cabinet
- Patch cables shall never create a trip hazard or other risk to equipment, services or personnel

#### 5.4 Copper Cable Termination

This section applies to both the workstation and closet cable termination practices. All copper cable terminations shall conform to ANSI/TIA/EIA 568A standards. The key areas and specifications are highlighted below:

- Pair twists shall be maintained as close as possible to the point of termination. Untwisting shall not exceed 13mm (0.5 in.) for CAT 5e links
- Strip back only as much jacket as is required to terminate individual pairs
- All connecting hardware shall be installed to provide well-organized cable management in accordance with manufacturer’s guidelines
- All four pairs must be terminated
- Pin/Pair assignments shall follow the T568A configuration (see Exhibit 8)

**Exhibit 8: T568A Pair/Pin Assignments**



## **6.0 INSTALLATION OF OPTICAL FIBER CABLES AND CONNECTORS**

This section provides the specifications to be used when installing all optical fiber cabling.

### **6.1 Fiber Horizontal Workstation Cable**

The fiber horizontal workstation cable connects the workstation to the wiring center. This cable shall be four-strand, multi-mode, 62.5/125  $\mu\text{m}$ , optical fiber cable with graded index 250 or 900  $\mu\text{m}$  buffer. Contiguous, 2-foot, segment-length markers shall be printed on the cable jacket.

The bend radius of any optical fiber cable installed shall be at least eight times the outside diameter of the cable. For example, a six-strand optical cable with an outside diameter of .30 inches and shall have a minimum bend radius of 2.40 inches.

Pulling tension for optical fiber cables must adhere to and not exceed manufacturer specifications.

### **6.2 Backbone Fiber Cable**

The optical fiber home-run backbone cable shall connect each remote wiring closet to the MDF. This cable shall be 12-, or 24-, or more strand, multi-mode, 62.5/125  $\mu\text{m}$ , optical fiber cable with graded index, 250 or 900  $\mu\text{m}$  buffer, and contiguous, 2-feet, segment-length markers printed on the cable jacket. All Intra and Inter-backbone fiber cables shall be installed in conduit or plenum-rated inner-duct.

Fiber-optic cable shall not share conduits with copper medium unless separation between copper and fiber is maintained. For large campus or complex backbone fiber installations where multiple conduits or pathways exist, fiber-optic cable shall be separated from the copper cable installation, wherein fiber-optic cable is dedicated to one conduit, copper to another. In retrofit or existing buildings, where pathways are insufficient to maintain separation between copper and fiber, INS DCB shall review and approve the design prior to installation.

### **6.3 Optical Fiber Cable Jacket**

All overhead or above-ceiling installations shall use optical fiber cable with a plenum-graded jacket that is marked with a UL rating of "OFNP" or equivalent. All non-air-return (non-plenum) installations can use optical fiber cable with either a plenum or non-plenum jacket (such as PVC) that is marked with a UL rating of "OFNR" or equivalent.

### **6.4 Optical Fiber Connector**

The optical fiber connector for workstation or backbone connections shall follow the ANSI/TIA/EIA standards for installation. INS is reviewing the MTRJ as an acceptable connector, but the use of this style will be determined on a case-by-case basis.

New buildings shall use SC or MTRJ type connectors for workstation and/or backbone installation.

In retrofit buildings, fiber connectors should match the existing installed connectors.

## **6.5 Optical Fiber Cable Termination**

All optical fiber cables shall be light tested prior to installation. This is typically done while the cable is still on spools or reels and only ensures all strands pass light prior to pulling cable into conduits and pathways.

The minimum termination shall be four strands for a horizontal cable. When installing fiber-optic backbone cabling, all strands will be terminated with the appropriate connectors and capped with a dust boot. All strands shall be terminated and tested.

All optical fiber cables shall have a twenty foot storage coil (wrapped in an appropriately sized loop for the minimum bend radius of the cable) positioned at each end, where possible before being terminated with connectors. All intermediate slack in the optical fiber cable shall be loosely coiled and suspended to avoid hard bends or kinks.

## **7.0 FACEPLATE CONFIGURATION**

Workstations that are not connected to an optical fiber cable typically utilize a single-gang faceplate that can support up to six connection ports (see Exhibits 2 and 3). When data only is installed in the faceplate, a dual, RJ-45 keyed information outlet shall be used, and it shall be installed in the top left position regardless of whether a single or dual gang faceplate is used. When voice and data are installed in the same faceplate, the dual RJ-45 information outlet shall conform to the configuration as outlined in Exhibit 2 and 3, whereas data is always keyed and voice is non-keyed. Voice shall be installed at the bottom left, data at the top left positions of all information outlets. Blank inserts shall be installed in all remaining positions.

Workstations that are connected to optical fiber cables shall have a double-gang faceplate and junction box installed that can support up to 12 connection ports (see Exhibit 4).

## **8.0 PATCH PANELS**

Patch panels, both fiber and copper are the approved methods of providing connectivity between horizontal cables, Intra and Inter-backbone copper, fiber backbone, and common network service devices, such as switches, PBX, routers, and other electronics.

Patch panel installation must adhere to manufacturer specifications and installed utilizing all wire management hardware, both front and back. Panels shall be installed to best utilize both vertical and horizontal wire managers, and should be separated by horizontal wire managers. There should be a minimum of one horizontal wire manager for each horizontal patch panel. Panels must be clearly marked as to the outlet designation. Labels must be of permanent indelible typed materials.

### **8.1 Copper Patch Panels**

Each panel will be installed to provide the maximum use of rack space. Each panel will be mounted in an equipment rack that shall conform to the EIA-310 mounting-hole spacing standard.

Separate patch panels will segregate "Data A", "Data B", "Voice A", and "Voice B" cables. The upper patch panel will be used for "Data A" only; the lower patch panel will be used for "Data B" only. In addition, and depending on the number of total cables, voice cables may also share a single standard 7-foot equipment rack, swing gate or cabinet enclosure. Exhibits 9, 10, and 11



shall be used as a model for all new installations, and should be followed as close as possible for major retrofits and renovations with respect to existing cable plant configurations. Deviations to these layout exhibits shall be reviewed and approved by the DCB.

## **8.2 Fiber Optic Patch Panels**

Optical fiber cable patch panels for workstation connections (also called fiber cabinets) shall provide ST, SC, or MTRJ couplers. Optical fiber cable patch panels for backbone cabling (also called fiber cabinets) shall provide SC or MTRJ couplers. The color scheme and the port numbering scheme on the patch panel shall be consistent in any given installation to reduce confusion and to prevent mistakes in making cross-connections. Fiber patch panels shall be installed in standard increments of six-position, ST, SC or MTRJ, loads or interconnect couplers, as required in each wiring closet and MDF.

## **9.0 EQUIPMENT RACK**

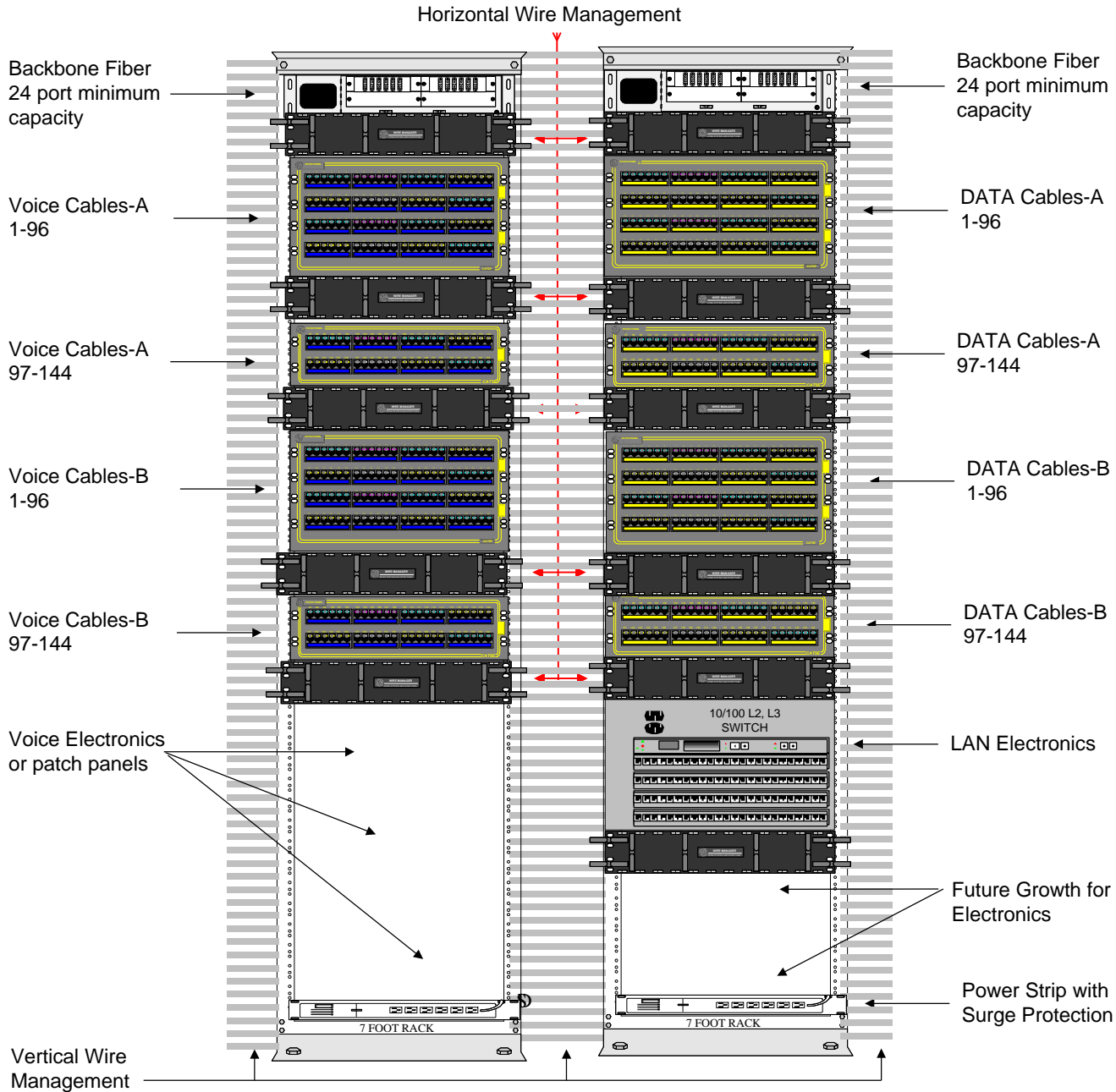
There are a multitude of equipment racks and cabinets that are acceptable for use in INS installations. Wherever possible, separate secure communication closets are recommended and are the preferred method for voice and data installation. In these dedicated communications closets, open racks, cabinets and swing gates may be used to meet the needs of the installation.

When open racks or swing gates are used, they shall be located within the wiring closets, and they shall provide structural support for the patch panels and required electronics. The open rack will be a standard 19 inches wide by 7 feet tall when used in a floor mount configuration. When space considerations mandate, it is acceptable to use an open, wall-mounted equipment rack (swing gate). If a wall mount configuration is used, the rack must be hinged, and space must be provided so that the rack can swing fully open and provide full access to the back of the rack.

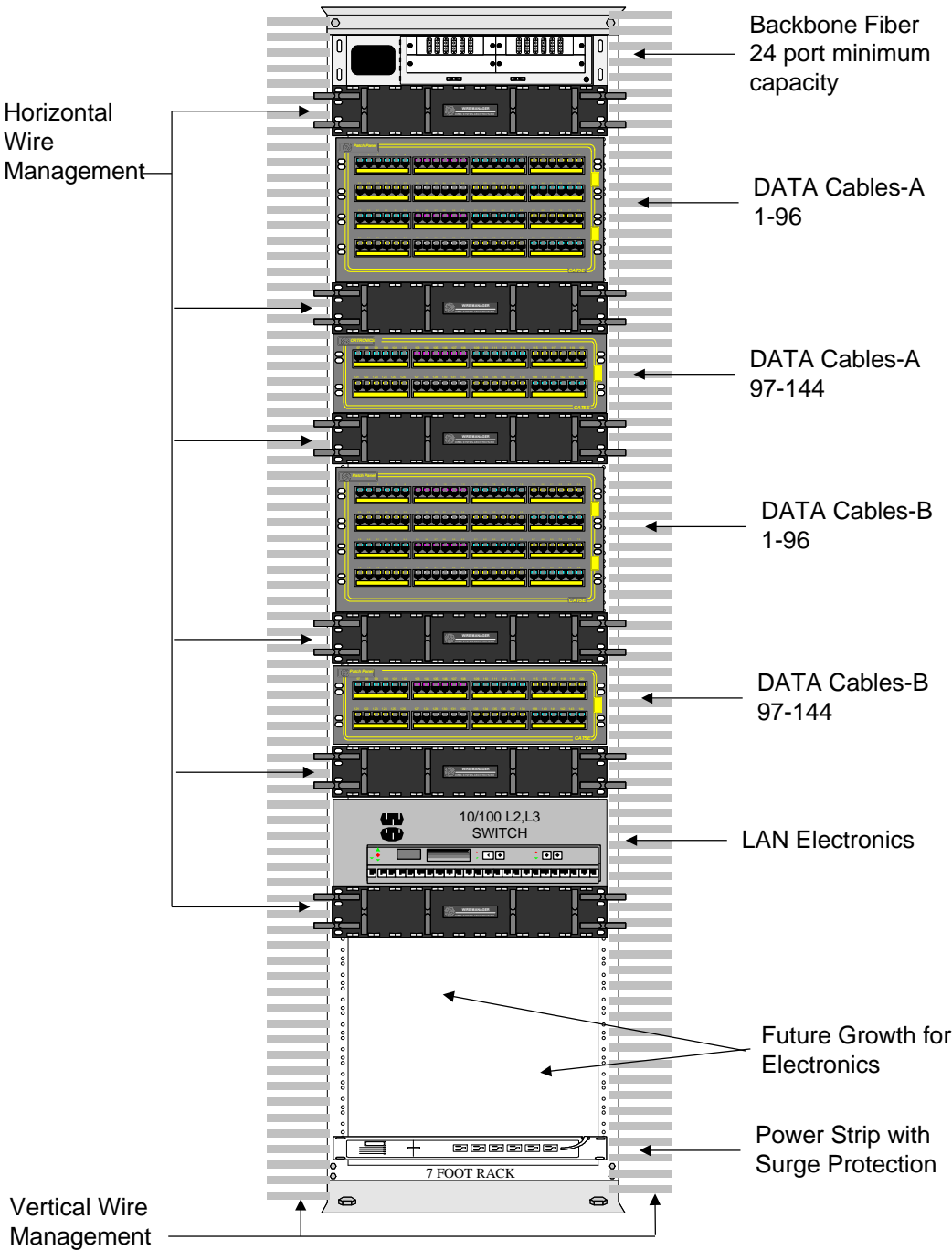
All floor or wall-mounted equipment racks, cabinets and swing gates installed in earthquake-prone geographic areas shall be installed in compliance with specific seismic guidelines, regulations and codes. Special attention must be taken to ensure the proper installation techniques are followed to minimize risk to electronics and cable plant, and most importantly prevent the mounting hardware from toppling over during seismic activity.

Equipment shall be mounted on the rack via holes in the frame or by using mounting hardware that conforms to the EIA-310 mounting-hole spacing standard. As an alternative for non-rack devices, equipment may be placed on flat shelves that are attached to the rack. All racks shall be secured either to the floor or wall with bolts or other fasteners that are rated to withstand the recommended weight limits and shear loads for the rack. Each rack shall include all mounting and assembly hardware (such as nuts and bolts) for full configuration use. When multiple racks and/or cabinets are used and they are butted together in the closet, they shall be bolted together for additional stability.

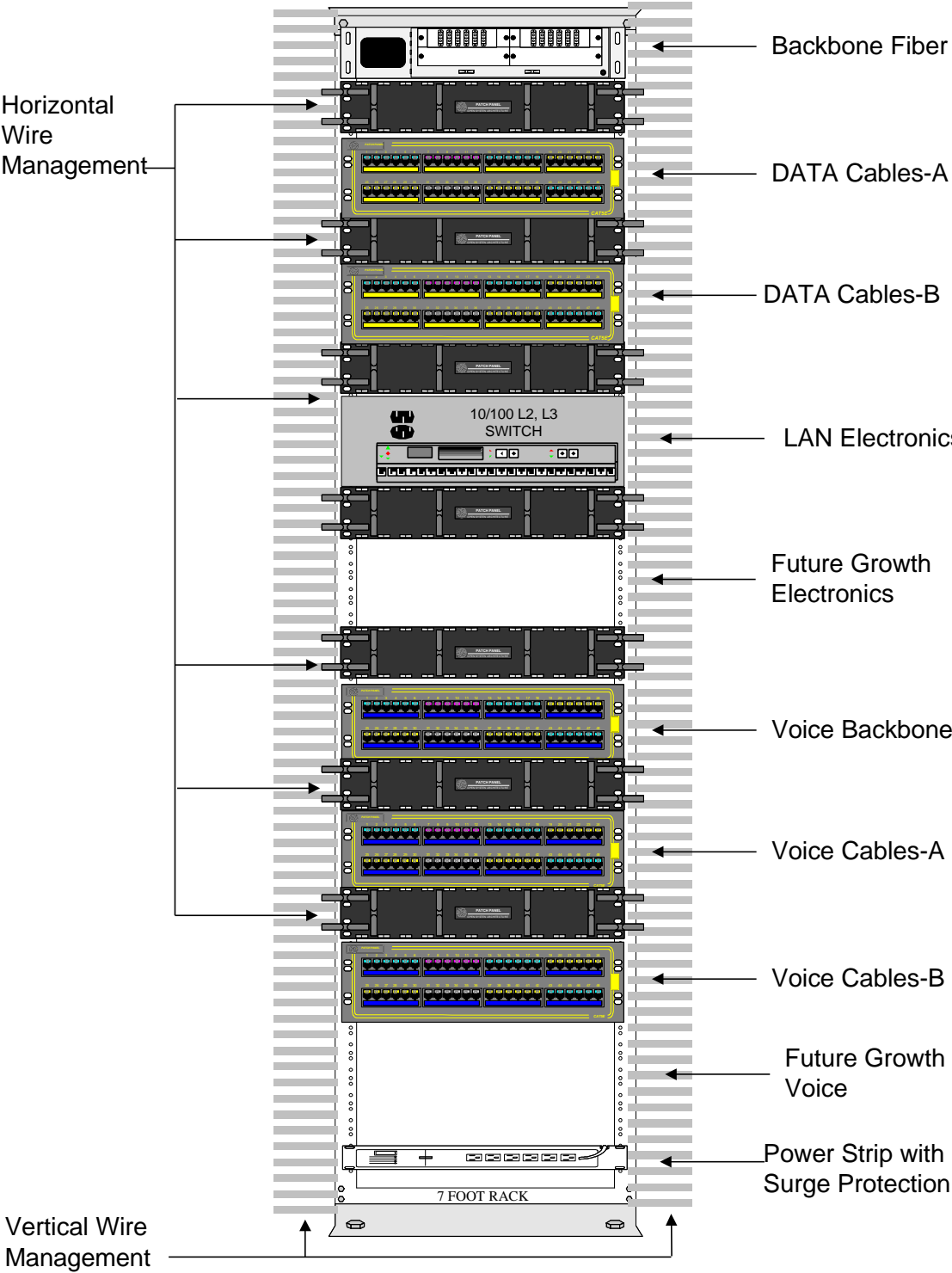
**Exhibit 9: Consolidated Closet, Voice and Data**



**Exhibit 10: Single Rack, Data Only (Voice and Data Not Consolidated)**



**Exhibit 11: Consolidated Closet, Voice and Data; Share Single Rack  
(less than 72 locations)**



Floor mounted racks and cabinets shall have a minimum of 36 inches of clearance in front of, behind, and on at least one side. Where space or room layouts limit the minimum clearances required, the installation contractor shall notify the DCB or designated representative for technical direction.

Equipment layout, specifically with respect to rack, cabinet, and swing gate location are critical design elements that ensure future growth, maintenance and flexibility are protected. Proper clearances also allow installers and maintenance personnel the required room to perform work safely and ensure electronics environmental conditions are maintained.

The patch cables shall run neatly through the wire management panels above the electronics, run down the sides of the rack, run below the electronics, and plug neatly into the respective port. The cables between the patch panels and the electronics shall not be excessively long nor shall they lie on the floor. The patch cables shall be secured and bundled using Velcro securing straps.

**Caution:** The use of tie-wraps is not acceptable when bundling and securing patch cables on the rack.

A power strip with surge suppression and an on/off switch shall be mounted to the back of the rack to supply at least six outlets for AC power (120-volt, 20-amp service).

## 10.0 GROUNDING

The NEC provides guidelines to ensure that electrical installations in buildings meet the necessary safety practices to prevent electrical shock hazards to personnel, ensure fault clearance of unintentional electrical breakdowns that could cause fire, and prevent transient voltages from causing electrical damage to installed network components. NEC Article 800 pertains to telecommunications industry and should be consulted for specific guidelines related to this topic. Article 800 also has references to other articles as the need arises.

In all new buildings and major retrofit projects an independent ground bus, installed in each communications closet, shall be provided. The independent ground bus in each closet should be installed by a certified electrician, or properly licensed installer. The independent ground buses are designated for, and utilized exclusively, by the communications equipment. In existing buildings, an independent ground is certainly desirable. In general, all communications systems, cable plant devices, equipment, and components shall be properly grounded and bonded.

All grounding shall be performed to meet the following published standards and guidelines:

- ANSI/TIA/EIA 607
- ANSI/IEEE C-142
- Federal Information Processing Standard (FIPS) 94
- NEC Articles 250 and 800
- UL
- ANSI CI-1978

All equipment racks, cabinets and systems must be properly connected to the independent ground bus per the ANSI/TIA/EIA 607 specifications. It is the responsibility of the cable

installer to connect all common closet equipment racks and cabinets to the provided ground bus. It is also the responsibility of the cable installers to report to the INS Program Manager any discrepancies with respect to improper or omitted grounding systems.

For connecting equipment within the telecommunications/data wiring closets to the ground bus, a number six wire with green insulation should be used. This ground wire should be no longer than 30 feet.

All ground wire should be routed straight, with sweeping bends, neat, and orderly. Ground wire should be routed in the most direct fashion possible to the equipment. Ground wires should be supported by tie-wraps at 12-inch intervals.

The manufacturer instructions and recommendations shall be followed when grounding the electronic equipment installed in the telecommunications/data wiring closets.

## **11.0 CABLE LADDERS AND FASTENERS**

All cables installed in overhead spaces (such as above ceiling panels) shall be securely strapped to ceiling slab fasteners or cable ladders that are fastened to the ceiling slab to avoid contact with lighting equipment or drop ceiling supports. Wire management channels or cable ladders shall be used to provide orderly arrangement of all installed cables in and around the equipment racks.

As a general rule, all cables shall be securely suspended, fastened, tied, and bundled firmly (without damaging the cable jackets or creating kinks in the cable) to minimize the amount of space required for cabling.

## **12.0 ADMINISTRATION AND LABELING CONVENTIONS**

Label conventions shall apply to all sites, regardless of the number of buildings at the site. This section describes the INS standard labeling convention for all cable installations, whether new or retrofit.

### **12.1 Building Designation**

The designation for the building shall be a two to four character alphanumeric scheme. Buildings typically have unique names/numbers, whether in multi-story complexes or in campus environments. The first designation should represent the unique building the cable plant is wired within. This nomenclature will rarely change throughout the life of the building and allows a structured naming convention to be used for Inter-building backbone cable installations.

#### **12.1.1 Floor**

The designation for the floor shall be a two-digit number. If the floor is a single number such as "4," place a leading zero before the single-digit, for example "04."

#### **12.1.2 Wiring Closets**

The designation for a wiring center is a single letter. The Computer Room or MDF shall always have the wiring closet designation of "M." Remote wiring closets that are all located on the same floor shall be labeled A-L and N-Z ("M" is reserved for the MDF). Closets that stack directly on top of each other shall have the same letter designation.

### 12.1.3 Cable Numbers

The designation for the cable shall be a three-digit number, followed by an “A” or “B” designation, indicating the “Data A” or “Data B” cable drop. Use leading zeros as necessary. For example, the designation for drop #3A would become 003A.

## 12.2 Information Management Outlet

The IMO is the interface for the workstation cable and the horizontal workstation cable, which terminates in a wiring closet. This is typically referred to as the “jack” in the industry, also an enhancement to the Bell Labs Universal Service Order Code (USOC) specifications. These specifications also referenced the RJ pin assignments. The ANSI/TIA/EIA now prefers to use the term 8-pin modular plug or connector when describing jack pin-outs. Each information outlet should be labeled according to the following guidelines:

The designations on single-gang and double-gang faceplates will be as follows:

- Building (AANN, or combination)
- Floor (NN, with a leading zero)
- Wiring center (A)
- Cable drop (NNN, with leading zeros).

For example: “TW-12-C-111”

where: TW = TechWorld building  
12 = 12<sup>th</sup> floor  
C = wiring center and  
111 = cable drop #111.

## 12.3 Intra and Inter-Building Backbone Cables

These backbone cables interconnect wiring closets either within a building or interconnect buildings in a campus environment.

The naming convention applies the same for Intra and Inter backbone cable labeling. Standard nomenclature for backbone cabling shall be as follows

- First Building (4–6 alphanumeric characters)
- First wiring closet (includes floor, closet and pair or strand designations)
- Second Building (2–4 alphanumeric characters)
- Second wiring closet (includes floor, closet and pair or strand designations)

For example, “TW801I-06-W-001 – TW800K-01-M-001”

where: TW801I = TechWorld building 801 I is the first building (origination point)  
6 = 6<sup>th</sup> floor  
W = wiring center, closet W  
001 = cable pair (copper) or strand (fiber)  
TW800K = TechWorld building 800 K is the second building (destination point)  
1 = 1<sup>st</sup> floor

M = wiring center, Main Distribution Frame  
001 = cable pair (copper) or strand (fiber).

The cable label shall be affixed to both ends of the cable, approximately 2 to 3 inches from the termination point. Heat shrink labels are preferable. Wrap-around labels are permissible as long as they are printed using indelible ink and the labels are easily read.

#### **12.4 Patch Panel Patch Cables**

The patch panel patch cord connects the horizontal workstation cable to the network electronics. Patch cables in each wiring closet should be identified on each end of the patch cable in a standard, one-up, numeric order, so that an individual patch cable can be easily identified without having to physically “tug” the cable to follow and identify it.

The cable label shall be affixed to both ends of the cable, approximately one inch from the termination connector or modular plug. The labels should be printed using indelible ink, and the labels should be positioned so they can be easily read.

### **13.0 TEST AND DOCUMENTATION PROCEDURES**

The installation contractor shall complete all testing of the cable plant. The installation contractor is responsible for providing all personnel, equipment, instrumentation, and supplies that are necessary to perform the required testing. All work shall be ANSI/TIA/EIA 568A, ANSI/TIA/EIA Telecommunications Services Bulletin (TSB)-67, NEC 770, and IEEE 802 standard specification quality (as applicable).

#### **13.1 Testing of Installed Copper Cable**

All installed copper cables shall be tested with a Level III cable tester to certify that the cable conforms to ANSI/TIA/EIA 568-A requirements in accordance with the TSB-67 specifications. The test device shall provide printed and electronic (soft) Pass/Fail test results that show the following:

- Electrical length in feet (accurate to 0.5 feet)
- Cross-talk in dB for each of the four pairs
- End-to-end attenuation in dB for each of the four pairs
- Drop number
- Continuity (for all eight wires)
- Capacitance
- DC resistance
- Impedance
- Date of test

#### **13.2 Testing of Optical Fiber Cables**

Testing shall be of the optical link as specified in ANSI/TIA/EIA-568-B.3 for multi-mode fiber optics and ANSI/TIA/EIA-526-7 method A for single-mode fiber optics. An optical fiber link is



defined as the passive cabling network between two optical cross-connects (patch panels or outlets). This includes cable, connectors and splices but does not include active components. The link test contains the representative connector loss at the patch panel associated with the mating of patch cords, but does not include the performance of the connector at the equipment interface.

If the manufacturer of cables or connecting hardware has supplied post-manufacture performance data, copies of such data are to be included in the documentation.

Testing of installed multimode fiber cable shall meet or exceed the specifications in Exhibit 12.

### Exhibit 12: Multimode Fiber Cable Specifications

Horizontal Fiber	Attenuation 850 nm	Attenuation 1300 nm
≤ 90 m	≤ 2.0 dB	≤ 2.0 dB
Backbone Fiber		
≤ 2000 m (6560 ft)	≤ fiber length (km) x 3.75 dB/km + number connector pairs x 0.75 dB + number of splices x 0.3 dB	≤ fiber length (km) x 1.5 dB/km + number connector pairs x 0.75 dB + number of splices x 0.3 dB

Testing of installed single-mode fiber cable shall meet or exceed the specifications in Exhibit 13

### Exhibit 13: Single Mode Fiber Cable Specifications

Length	Attenuation 1310 nm	Attenuation 1550 nm
≤ 90 m (295 ft)	≤ 2.0 dB	≤ 2.0 dB
91-1000 m (3281 ft)	≤ 3.0 dB	≤ 3.0 dB
1001-2000 m (6562 ft)	≤ 3.3 dB	≤ 3.3 dB
2001-5000 m (16404 ft)	≤ 4.7 dB	≤ 4.7 dB

Test reports shall include the following information for each cabling element tested:

- Actual measured and maximum allowable attenuation (loss) at the specified wavelengths
- Reference method
- Number of mated connectors and number of splices (if any)
- Actual length and maximum allowable length
- Group refractive index (GRI) for the type of fiber tested, if length was optically measured
- Tester manufacturer, model, serial number and software version
- Fiber ID number and project/job name
- Link criteria used
- Overall pass/fail indication
- Date and time of test

Test reports may be submitted in hardcopy , electronic, or both formats. INS prefers these reports to be provided in the electronic format over hardcopy.

## **14.0 BUILDING PATHWAYS, CONDUIT, AND CLOSETS**

### **14.1 Closet Specifications (MDF and RWC)**

Typical communications closets house common equipment required to support both voice and data connectivity to workstations. Communication closets/rooms are typically centrally located on the floor, and adhere to the ANSI/TIA/EIA specifications for cable lobe lengths (e.g. maximum cable from closet to workstation will not exceed 100 meters, end-to-end). Closets/rooms should be vertically stacked, with a sufficient number of sleeves interconnecting each closet. All wiring centers shall comply with or support the following specifications and requirements:

#### **14.1.1 General Requirements**

- The space should be environmentally temperate, convenient, and professional looking.
- The communication closets must have sufficient infrastructure required to support the variety of communication services provided to INS and contractor staff. Typically this includes items such as conduits, cable trays, building grounding system, etc.
- Communications closets should be designed for growth, and flexibility supporting new technologies without the need for major room modifications and rearrangements.

#### **14.1.2 Environmental**

- Room should be dust free with positive air pressure where possible and meet Federal guidelines for specified material to reduce airborne contaminants caused by off gassing.
- Ceilings should be finished with similar drop tiles used throughout the floor.
- Overhead lighting sufficient to provide 80 candle feet measured five feet above the finished floor, is to be switched controlled and is not to be connected to communications equipment circuits.
- Care must be taken to avoid structural columns, ductwork, other building structures, which would restrict the functionality of the space.
- Ceiling space above communications closets should be open and clear of major Heating, Ventilation, and Air Conditioning (HVAC) systems and ductwork, including major motors, elevator motors, generators, or equipment that induce excessive EMI and/or RFI to communications equipment or systems.
- Room temperature must be maintained between 65 to 85 degrees Fahrenheit, with a relative humidity range of 20 to 60 percent. When heat-generating equipment is placed into communication closets, maintaining environmental parameters is essential, thus avoiding down time due to equipment failures caused by equipment over heating. Where the building HVAC is insufficient to maintain these parameters a standalone HVAC system should be considered to maintain these environmental ranges for 24 hour, 7 days a week (24/7) schedule.

- Where no dedicated HVAC system is required for plenum air return buildings, there should be a minimum of two diffusers for fresh HVAC air intake, with a minimum of two air return vents, vented door and a positive air flow maintained. Buildings without air return systems should provide clean air 24/7. Additionally, rooms without dedicated HVAC systems should have a continuous airflow 24/7.

#### **14.1.3 Construction**

- Closets vary in size depending on their function. However, minimum communications closet size should never be less than specified in the applicable ANSI/TIA/EIA specifications. INS typical closet minimum size should be no less than 80 square feet, whereas the recommended size is calculated by the ANSI/TIA/EIA specifications.
- Door locks for all communications rooms will conform to local security requirements.
- Door must be a minimum 36 inches wide by 80 inches high. The door should swing out to facilitate equipment installation and provide maximum space utilization by allowing higher density equipment designs and configurations without the concern of lost space due to door travel.
- Floor should be rated to withstand 100 pounds per square foot and should be covered with appropriate tile or linoleum. Carpets are not acceptable in communications closets.
- Each communications closet should have a minimum of 2 separate 120 Volt @20A circuits installed for cable plant electronics. Preferred outlets are the National Electrical Manufacturers Association (NEMA)-20 5 quad receptacles. Outlets should be installed at heights that adhere to the building electrical codes, typically 18 inches above finished floor. Additional circuits may be required as equipment density is increased.
- A certified electrical ground and buss shall be installed into each closet for communications equipment grounding and be connected to a dedicated building ground, that is compliant with the ANSI/TIA/EIA 607.
- For the MDF, a pre-treated, fire-rated, plywood backboard (3/4 inches by 4 feet by 8 feet sheets) shall be fastened properly to the wall for riser cable control, where required.
- All cable shall be neatly tie-wrapped and anchored every 3 feet on the backboard
- INS occupied floors that are contiguous, with stacked closets, should have a minimum of two 4-inch sleeves between closets for INS Data and Voice cables. Additional sleeves will be required for the building voice riser system. Where INS data and voice cables must pass through communications closets not controlled by INS or the US government, mechanical protection must be provided. Thin wall ridged conduit will be sufficient for this requirement.

#### **14.2 Conduits**

Conduit installations shall comply with all ANSI/TIA/EIA 569 specifications. Highlights of that specification are as follows:

- A maximum fill factor of 40% per conduit shall be adhered to for new conduits. If possible, installers shall avoid using those conduits that have exceeded the 40% fill factor
- A pull-box shall be installed every 100 feet and every two 90-degree turns

- All bends in the conduit must be made hydraulically to create smooth, sweeping turns
- All pull-boxes shall be sized to allow for the largest minimum bend radius for any of the cables that are used
- Where local codes mandate that rigid conduit must be installed from the distribution closet to the IMO, a minimum of one 1-inch diameter conduit from wiring center to workstation IMO is required. This single, 1-inch conduit will support both voice and data grade cabling to the workstation and requires a consolidated voice and data closet.
- In buildings which local codes do not mandate rigid conduit from the distribution closet to the IMO, a minimum of one 1-inch diameter conduit from above ceiling grids to respective IMO is recommended. These conduits are referred to as "ring and string" within the industry, and typically provide a pathway for plenum cable installation into the outlet box. Although many local codes do not require rigid conduits for low voltage wiring, INS DCB recommends the general contractor install these for each IMO.
- Open office space (e.g., systems furniture where two or more IMOs are fed by a single column or feed) typically does not require conduit stubs or home-run conduits. If conduits or stubs are installed, then conduit sizing shall ensure fill factor does not exceed 40%.
- A minimum of two 4-inch diameter sleeves shall be provided for vertically stacked closets. In open plenum environments, where access to closets are not blocked by building structures or fixtures, and a clear pathway exists, conduit installation is not required to interconnect closets. Exceptions will be made by the INS Project Manager
- A minimum of two 4-inch diameter conduits shall be provided in any building or campus environment where cable is subject to damage or there is no clear pathway for installation. These may be areas such as underground parking garages, outside cable routes, pathways through office space not under INS control, or areas that prevent cable installation at future dates, such as main building lobbies, under-floor pathways, etc.
- A minimum of two 4-inch diameter conduits between buildings in a campus environment

## **15.0 DOCUMENTATION**

Upon completion of the cable plant installation, a documentation package shall be completed within 30 calendar days that shall include the following items:

- Letter of certification from the installing organization
- Completed Contractor Information Form
- Detailed materials list
- Cable plant test certification letter
- Electronic Copper cable test results (soft)
- Electronic Fiber-optic cable test results (soft)
- As-built site drawings

All of this information shall be provided in both hardcopy and electronic formats, except as follows:

- Electronic Fiber test results (soft)
- Electronic Copper test results (soft)

### **15.1 Letter of Certification**

A letter of certification shall be supplied to the designated INS Program Manager from the authorized project supervisor. A sample of the recommended letter of certification is included as Appendix B of this document. A letter of certification shall be supplied to the designated INS Program Manager from the authorized project supervisor. A sample of the recommended letter of certification is included as Appendix B of this document. The letter of certification should be submitted in electronic format using word Processing software compatible with Microsoft Word for Windows, Version 6.0 or lower.

### **15.2 Implementation Report**

A brief implementation report shall be submitted as part of the completed documentation package. This implementation report, at a minimum, should include the following information:

- Installing company name and address
- Contract number and Task or Delivery Order, if any
- Beginning and ending dates of the installation project
- Names of personnel assigned to the installation project
- Installation summary, including deviations from the original task order
- Responsible party names, address, and phone number.

The electronic version of this report shall be submitted using word Processing software compatible with Microsoft Word for Windows, Version 6.0 or lower. A sample implementation report is provided as Appendix D of this document.

### **15.3 Detailed Materials List**

A detailed materials list shall be included as part of the completed documentation package. At a minimum, this list shall include all materials originally called for from the site survey report, actual materials used for the installation project, and a column that shows the deviation between the two. Any unusual deviations in required quantities should be explained in the implementation report, as described previously.

The detailed materials list should be completed and submitted using spreadsheet software compatible with Microsoft Excel for Windows, Version 6.0 or lower. A sample form to be used for this list is provided as Appendix E of this document.

### **15.4 Cable Plant Test Certification Letter**

In lieu of the responsible installation supervisor providing a signature on each printed cable test result, a letter of certification from the installation supervisor may be included to verify that

installation personnel doing the testing have been properly trained in the use of the test equipment and that the test results included have been reviewed and are an accurate reflection of the installed cable plant.

The certification letter should be submitted in electronic format as a word Processing document compatible with Microsoft Word for Windows, Version 6.0 or lower. A sample cable plant test certification letter is included as Appendix F of this document.

### **15.5 Copper Cable Test Results**

Test results for all cables shall be included in electronic format (ASCII text format) within the completed documentation package upon completion of the project. The cable test results shall be provided in numeric order on a per closet basis for horizontal cables. All copper tie and backbone cables shall be included as a sub-section and also numbered.

### **15.6 Fiber-optic backbone Cable Test Results**

A hard copy of all fiber-optic cable test results shall be included as part of the completed documentation package. Opposite ends of each fiber strand tested should be included side by side or in direct sequential order. The fiber optic test results shall be submitted in a closet by closet format.

The electronic trace version of the test results should also be included. If a specific executable program is required to view the trace on a personal computer, a copy of this executable file shall be included with the electronic files.

### **15.7 As-Built Site Drawings**

Complete as-built site drawings of the cable plant shall be included as part of the completed documentation package. At a minimum, the following information shall be included on the drawing:

- Accurate, reasonable facsimile of the building floor plan
- Room and area numbers assigned for identification purposes
- Location and designation of all wiring closets
- Location and designation of all information outlets installed
- Routes for all cables, including horizontal, tie, and backbone
- Location of all vertical penetrations
- Location of horizontal penetrations through fire walls
- Any special service application notes
- Backbone and tie cable lengths between closets.

These as-built site drawings shall be completed using computer-aided drawing software that produces vector graphics data files, preferably AutoCAD version 2000 or lower.

***Attachment A***  
***Glossary***

AC	Alternating Current
ACR	Attenuation to crosstalk ratio
ADP	Automated Data Processing
ANSI	American National Standards Institute
AWG	American Wire Gauge
CAT	Category
CSA	Canadian Standards Association
dB	Decibel
DCB	Data Communication Branch
DO	District Office
DOJ	Department of Justice
EF	Entrance Facility
EIA	Electronic Industries Association
ELFEXT	Equal Level Far End Cross-talk
EMI	Electromagnetic Interference
FCC	Federal Communications Commission
FIPS	Federal Information Processing Standard
GRI	group refractive index
HVAC	Heating, Ventilation, and Air Conditioning
ID	Identification
IDC	Insertion Displacement Connector
IEEE	Institute of Electrical and Electronics Engineers
IMO	Information Management Outlet
INS	Immigration and Naturalization Service
ISO	International Organization for Standardization
km	kilometers
LAN	local area network
μm	micrometer
Mbps	Megabits per second
MC	main cross-connect
MDF	Main Distribution Frame
MHz	MegaHertz
NEC	National Electrical Code
NEBS	National Electrical Bell Standards
NEMA	National Electrical Manufacturers Association
NEXT	Near End crosstalk
NFPA	National Fire Protection Agency



ns	nanosecond
OFNP	Optical Fiber Plenum
OFNR	Optical Fiber Riser
OFN	Optical Fiber, not rated
OIRM	Office of Information Resource Management
OTDR	Optical Time Domain Reflectometer
PCB	Printed Circuit Board
PS ACR	Power sum attenuation to crosstalk ratio
PS NEXT	Power sum near-end crosstalk
PS ELFEXT	Power sum
RFI	Radio Frequency Interference
RJ	Remote Jack
RWC	Remote Wiring Closet
TIA	Telecommunications Industries Association
TR	Technical Reference
TSB	Telecommunications Services Bulletin
UL	Underwriter's Laboratory
USOC	Universal Service Order Code
UTP	Unshielded Twisted Pair
WAN	wide area network

ACR	Measurement of NEXT-Attenuation
Attenuation	The decrease in magnitude of a wave as it travels through any transmitting medium, such as a cable or circuitry. Attenuation is measured as a ratio or as the logarithm of a ratio decibel.
CAT 5e	A type of cable passing ANSI/TIA/EIA specifications, which allows data to be transmitted at 100 MHz.
Conduit	A pipe, usually metal, that runs either from floor to floor or along a floor or ceiling to protect cables.
Cross-talk	A type of interference caused by audio frequencies from one line being coupled into adjacent lines. The term is loosely used also to include coupling at higher frequencies.
Delay Skew	The propagation delay difference between the slowest and fastest cable pair.
EIA	Electronic Industries Association: the US national organization of electronic manufacturers. It is responsible for the development and maintenance of industry standards for the interface between data processing machines and data communications equipment.
EMI	“Noise” generated in copper conductors when electromagnetic fields induce current. External signals that disrupt the data transmitted on the local area network or electronic device being operated.
End-To-End Connection	A continuous connection, for example, from a workstation to a concentrator.
FC Connector	A type of optical fiber connector identifiable by its round, screw-operated locking nut. It is usually metal. Its ruggedness leads it to be widely used in test equipment. (Source BICSI Telecommunications Dictionary)
FEXT	Cross-talk measured at the opposite end from which the disturbing signal is transmitted.
Frequency	The number of times a periodic action occurs in a unit of time. The number of cycles that an electrical current completes in one second, expressed in Hertz.
Frequency Range	The range, measured in Hertz of a test signal.
Hertz	The unit of frequency, one cycle per second.
IEEE	Institute of Electrical and Electronics Engineers: An international professional society that issues its own standards and is a member of ANSI and ISO.
LAN	A geographically limited communications network intended for the local transport of data, video, and voice. Often referred to as a customer premises network.

Loose Tube	The fiber is contained in a plastic tube for protection. To give better waterproofing protection to the fiber, the space between the tubes is sometimes gel-filled. Typical applications are outside installations. One drawback of loose buffer construction is a larger bending radius. Gel-filled cable requires the installer to spend time cleaning and drying the individual cables, and cleaning up the site afterwards.
Megabits	A million bits per second: A unit of data transmission speed.
MDF	The main distribution frame, where central networking components are located. This refers to closets and large computer rooms and in most cases houses the WAN equipment and circuits. These rooms are the core rooms in a building or campus environment.
MTRJ connectors	The MT-RJ fiber optic couplers provide a complete system for premises applications. As the name suggests, the system was designed to bring many of the benefits of the RJ-45 modular plug and jack system to fiber optics: small size, lower costs, easier application, and easier use.
Nanosecond	One billionth of a second ( $10^{-9}$ seconds).
NEXT	Crosstalk measured at the end from which the disturbing signal is transmitted. Near End crosstalk is a measure of how much energy is coupled at the near end in a pair that is adjacent to an energized pair, and FEXT is the same measure at the far end from the transmitter. When all pairs are energized, as with Gigabit Ethernet, NEXT and FEXT are generated by each disturbing pair and must be power-summed to obtain a true measure of the coupled energy.
OFN, OFNP, OFNR	Type of optical fiber cable construction, which stands for: general purpose, plenum(P) or Riser (R)
Patch Panel	A modular termination and connection point for horizontal distribution cabling.
Plenum	A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system. (Source National Electric Code)
Protocol	The means used to control the orderly exchange of information between stations on a data link or on a communications network or system.
Propagation Delay	The amount of time that passes between when a signal is transmitted and when it is received at the opposite end of a cable or cabling.
PS NEXT	Power sum near end crosstalk. Measurement
PVC	Polyvinyl Chloride: A type of plastic material used to make cable jacketing.
Return Loss	Return loss is a measure of the signal reflections occurring along a channel or basic link and is related to various electrical mismatches along the cabling.

RJ-45 Keyed Connector	An eight-conductor modular phone-style receptacle with a plastic tab on the side. This type of connector can only be inserted into a keyed jack.
RJ-45 Non-Keyed Connector	An eight-conductor modular phone-style receptacle without a plastic tab. This type of connector can be inserted into either a keyed or non-keyed jack.
SC connectors	Fiber connector that is duplexed into a single connector clip with both transmit/receive fibers.
ST connectors	Keyed, bayonet-style connector, very commonly used
TIA	Telecommunications Industries Association: The US national organization of telecommunications manufacturers. It is responsible for the development of data processing machines and data communications equipment.
Tight Buffered	Buffer layers of plastic and yarn material are applied over the fiber. Results in a smaller cable diameter with a smaller bending radius. Typical applications are patch cords and local area network connections. At least one mfr. Produces this type of cable for inside/outside use.
UTP	A cable with multiple pairs of twisted insulated copper conductors bound in a single sheath. An unshielded twisted pair CAT5 or 5e cable usually contains four pairs of wire in a single jacket.
WAN	Wide Area Network: A network that uses common-carrier-provided lines, usually to connect two or more LANs.

***Attachment B***  
***Sample Letter of Certification***

*[Use Corporate letterhead]*

*[Title]*

**Date:** [Current date]

**To:** [Full name of individual to whom the letter is being sent]

**Address** [of individual to whom letter is addressed]

**Re:** Cable Plant Installation

**Task Order No.:** [XXX-xxx]

Dear *[Mr., Ms., or Dr. and last name]*:

I hereby certify that the cabling installation completed for the above referenced INS site was completed by our firm, according to the INS Structured Cabling Standards, on *[date of installation in Month Day, Year]*.

Our firm has tested each unshielded twisted pair copper cable wire (not just cable pairs) we installed, as well as any previously installed Category 5 or 5e cable, if applicable, which will be re-used as part of this Task Order. I hereby certify that every wire and cable was tested and meets or exceeds the CAT 5e ANSI/TIA/EIA 568A transmission test requirements.

Our firm also tested each fiber-optic cable and strand we installed, as well as previously installed fiber-optic cable that will be used as part of this Task Order. I hereby certify that each strand of every cable meets or exceeds the required standards for fiber-optic cable.

*[Mr., Ms., or Dr. and full name]*

*[Title]*

***Attachment C***  
***Sample Contractor Information Form***

## CONTRACTOR INFORMATION

JOB NAME: LOCATION:

**DATE:**      **PROJECT:** Cable Plant Installation

FIBER CONTRACTOR

NAME:      PHONE:

ADDRESS:

CITY, STATE, ZIP:

CONTACT NAME:

COMPLETION DATE:

SCOPE OF WARRANTY RESPONSIBILITY:

In accordance with Existing Contract

SUPPLIED MATERIALS:

In accordance with Task Order XXX-xxx

COPPER CONTRACTOR

NAME: PHONE:

ADDRESS:

CITY, STATE, ZIP:

CONTACT NAME:

COMPLETION DATE:

SCOPE OF WARRANTY RESPONSIBILITY:

In accordance with Existing Contract

SUPPLIED MATERIALS:

In accordance with Task Order XXX-xxx



***Attachment D***  
***Sample Implementation Report***

## PROJECT IMPLEMENTATION REPORT SITE C

### INTRODUCTION

Company A under sub-contract to Company B, and working under Task Order Number XXX-xxx, recently performed a local cable plant installation at Site C. The project was begun on Monday July 7, 1997, and the installation was completed on Wednesday, July 23, 1997.

### PROJECT PERSONNEL

The following Company A personnel participated in the installation project at Site C:

Mr. X	Program Manager
Mr. Y	Task Team Leader
Mr. Z	Senior Network Engineer

### INSTALLATION SUMMARY

The network installation was completed in accordance with the Task Order, using the Site Survey Report as the guide for project completion. In accordance with the design documentation, two buildings at the headquarters site were cabled for a total of 52 dual cable drops. All drops were installed through a self-suspended overhead cable routing system above the acoustic ceiling tiles in the office areas and garage of Site C.

Two wiring closets, designated wiring closet HQ-01-A and HA-01-A, serve the workstation connectivity needs for Site C. The main building cables are identified by labels starting with HQ-01-A. The garage cable drops are identified by labels beginning with HA-01-A. All 45 copper cable drops for closet HQ-01-A terminate on the patch panels in the equipment racks located in room 118, which also serves as the main computer room. The seven drops in the garage in wiring closet HA-01-A terminate on the patch panels located on the equipment rack in room 105.

A six-strand multi-mode fiber-optic cable connects wiring closet HA-01-A in the garage to wiring closet HQ-01-A in the main building.

There were no modifications made to the design documentation from the Site Survey Report. All material was provided and installed in accordance with the materials listing in the report.

### PROJECT DOCUMENTATION

Included within the As-built documentation package, both in hard copy and electronic format, is the following information:

<u>Item</u>	<u>Electronic Format</u>
Letter of Certification	Word processing compatible with Microsoft Word for Windows (Version 97), or lower
Implementation Report	Word processing compatible with Microsoft Word for Windows (Version 97), or lower
Contractor Information	Word processing compatible with Microsoft Word for Windows (Version 97), or lower
Cable Plant Database	Spreadsheet compatible with Microsoft Excel (Version 97) or lower
Detailed Materials Listing	Spreadsheet compatible with Microsoft Excel (Version 97) or lower
Cable Plant Test Results	ASCII Text File
Active Equipment Installation Log	Spreadsheet compatible with Microsoft Excel (Version 97) or lower
As-built Site Drawings	CAD format compatible with AutoCAD Version 2000 or lower
Wiring Closet Detail	Raster or Vector drawing compatible with Visio Professional (Version 5.0) or AutoCAD Version 2000 or lower

### CONCLUSION

The installation project was completed on Wednesday, July 23, 1997.

All materials and workmanship provided by Company A are fully warranted under the terms of the existing contract between Company B and Company A.

Any questions concerning the project installation, documentation, and warranty may be addressed to Mr. Y of Company A. Mr. Y can be reached at (000) 555-0000.

***Attachment E***  
***Sample Detailed Materials List***

Item No.	Description	Projected Quantity	Actual Quantity	Variance
1	Wire Management Panel	6	6	0
2	48 Port Patch Panel	2	2	0
3	24 Port Patch Panel	4	4	0
4	Single Gang Faceplate, 6-plex CAT-5e	25	25	0
5	Workstation Blank Insert	50	50	0
6	Dual RJ-45 Jack, 568A, Keyed	25	25	0
7	CAT-5e Cable, 24-4/P, plenum, feet	15000	15000	0
8	Patch Cord, yellow, 14 feet	30	30	0
9	Patch Cord, yellow, 10 feet	70	70	0
10	Open Rack, self support, double sided	1	1	0
11	Rack Mount Power Outlet Strip	2	2	0
12	Bay Networks Baystack 101 10BaseT Hub	1	1	0
13	Bay Networks Baystack Ethernet NMM	2	2	0
14	Bay Networks Baystack Fiber Media Adapter	1	1	0
15	19" Clear Vented Double Sided Rack Tray	1	1	0
16	Panduit 0.9" x 1.5" Latching Duct, 6 foot lengths	8	8	0
17	Data Tab (Computer Icon) 100/PACK	2	2	0
18	Fiber-optic cable, Six-Strand, feet	600	300	300
19	Bay Networks 3314A-04 Ethernet NMM	2	2	0
20	Bay Networks 3308B 10BaseT Ethernet HM	6	6	0
21	Bay Networks 3000NT Concentrator	1	1	0
22	Box Eliminators	50	50	0
23	Surface Mount Box	14	14	0
24	Panduit 0.53"x1.01" Latching Duct, 6 foot lengths	14	14	0
25	Fiber Distribution Center	2	2	0
26	FDC Connector Panel, Preloaded w/ 6 ST	2	2	0
27	Dual Fiber Jumper Cable, ST to ST, 10 feet	2	2	0

***Attachment F***  
***Sample Cable Test Certification Letter***

*[Use Corporate letterhead]*

**Date:** [Current date]

**To:** [Full name of individual to whom the letter is being sent]

**Address:** [*of individual to whom letter is addressed*]

**Re:** INS Cable Plant Installation at Site C

**Task Order No.:** [XXX-xxx]

Dear [*Mr., Ms., or Dr. and last name*]:

This letter is to certify that all cable test results included for the above mentioned project has been completed by Company A personnel who have been trained, and are competent in the use of, the required cable testing equipment.

Please accept this letter as certification of the accuracy of the test results furnished in lieu of individual signatures on each cable test result.

[*Mr., Ms., or Dr. and name*]

[*Title*]